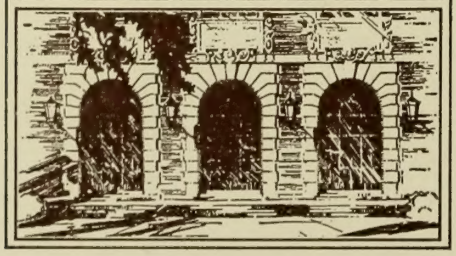

INVENTORY OF

BUILDING AND RELATED NEEDS

As Requested by

COLLEGES, SCHOOLS, AND DEPARTMENTS

of the

UNIVERSITY OF ILLINOIS

Urbana and Chicago
Illinois

UNIVERSITY OF ILLINOIS
URBANA, ILLINOIS

April 1, 1944

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Compiled by

THE UNIVERSITY BUILDING PROGRAM COMMITTEE

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From Material Submitted by

COLLEGES, SCHOOLS, AND DEPARTMENTS

UNIVERSITY OF ILLINOIS
URBANA, ILLINOIS

April 1, 1944

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SECTION 1

GENERAL INTRODUCTION

The Building Program Committee of the University was appointed by the President and charged with the responsibility for making recommendations concerning the construction of new buildings, the remodeling and reconditioning of present buildings, the providing of adequate heating, lighting, power and water systems on the campuses in Urbana-Champaign and Chicago and the general improvement of these campuses.

During the past several months, the Committee has been actively studying the present needs of the various Colleges, Schools and Departments and the probable needs during the post-war period, as well as in the more distant future. It has been provided with reports on this subject by the building committees or individuals representing the various administrative units. In order to provide the desired information and to be reasonably uniform in character, these were prepared according to certain general specifications provided by the Committee. The reports are included in this "Inventory of Building and Related Needs" essentially as they were received. The committee or person under whose direction each was prepared is noted at the end of that report. The comments, opinions and recommendations included in these reports are made for the information and guidance of the Building Program Committee but are, in no sense, expressions of opinions or recommendations of the Committee.

This inventory, supplemented by numerous conferences with those concerned, is for the use of the Committee as a basis of recommendations of projects to be undertaken during the post-war period. These recommendations are not included in this report but are to be submitted separately.

It is expected that the information included in this inventory will be useful, for many years to come, in preparing recommendations for future biennial budgets. New needs will develop and present ideas will change to suit changing conditions but the fundamental program of the University will continue. Consequently, buildings are being so designed that they can be adapted to new uses.

The requests which have been received are arranged in Sections according to Colleges and Schools. Certain projects which are general in character and provide for the use of all branches of the University are grouped in one Section entitled "General University Projects". The order of arrangement of the Sections has no significance so far as relative urgency or importance are concerned. Also, the arrangement of Projects within a Section has no bearing on their importance or the construction priority which should be assigned to them.

Many of the Projects are interrelated. The construction of a new building called for in one Project might result in the vacation of space in a present building which could be remodeled and reconditioned to provide for one or more other Projects. In other words, the total requirement for new space is considerably less than the sum of the space requirements of the individual Projects.

The members of the Building Program Committee appreciate the excellent cooperation which has been given them by the building committees of the various Colleges and Schools and by individuals within these organizations. Their task has been a difficult one and it is hoped that the final result of their studies will far more than justify their efforts.

Prepared by: W. C. Huntington
Chairman, Building Program Committee

SECTION 2

PROJECTS PROPOSED BY

COLLEGES OF MEDICINE, DENTISTRY AND PHARMACY

SECTION 2

PROJECTS PROPOSED BY

COLLEGES OF MEDICINE, DENTISTRY AND PHARMACY

GENERAL COMMENTS

Presented herewith, is material for consideration of the University Building Program Committee. Two years ago last July the State Department of Public Welfare transferred to the University of Illinois all the buildings in the Research and Educational Hospitals except the Illinois Neuropsychiatric Institute and the Institute for Juvenile Research.

In the intervening period, major changes in the University program have been brought about both by the war and by the requirements of normal growth. These changes have been reflected in the hospital remodelling program and in plans for post-war development. In this process the Building Committee of the Chicago Colleges has formulated a program of education and research needs which has become the basis of studies for future physical growth. The plan for expansion is designed to be carried out within a ten-year period but we estimate that it will meet the probable needs for a period of thirty years. The realization of this plan will put the University in a position of equality with other professional schools.

The expansion plan involves more, however, than improvement only of those facilities provided by the University itself. Other agencies, notably the State Department of Public Welfare, the State Department of Public Health and the Presbyterian Hospital are well established in the locality and have a vital interest in development plans. To serve this group an area of approximately forty acres, including the University campus, has been designated the Illinois Medical Center. This area is to be available for expansion for the four agencies mentioned. The University expects to remain an active working

unit within the group and all plans proposed recognize the interests and needs of the other institutions. They are intended to accord with the ultimate development of the Illinois Medical Center.

The center, in turn, bears a similar relation to the larger Medical Center district. That district, 305 acres in size, bounded by Congress Street, Ashland Avenue, Roosevelt Road, and Oakley Boulevard, has been established by state law as an area for the development of medical services. The Medical Center Commission, acting under the law, is undertaking the large task of stimulating development plans in all interested institutions, leading towards an ultimate unified plan. It has given its approval to the proposed plans for the Illinois Medical Center. Dr. R. B. Allen, Executive Dean of the Chicago Departments and Dean of the College of Medicine, is a member of the Commission. Also on the Commission are Dr. Walter H. Theobald, a member of the College of Medicine Staff, and Mr. George A. Barr, a former member of the Board of Trustees.

Within the district, several functional units are anticipated. The Illinois Medical Center constitutes one of these; the Cook County Hospital group, with an assigned expansion area of approximately 35 acres, constitutes another; and still other medical groups are expected to develop in the area west of Damen Avenue. It is hoped that these will include a Veterans' Health Center, other Government hospitals, other Medical schools, and private hospitals such as a Childrens' Hospital, a Lying-In Hospital, an Isolation unit, and a Convalescent Hospital. The eventual plan is for a district which will provide a well-balanced group of medical service and teaching institutions.

By virtue of its forward-looking educational program, the University of Illinois occupies a leading position in the District. In that

position it has the opportunity of setting an outstanding example of progressive development. The final success of the Medical Center District program will depend in great part upon developments realized by the institutions already established. Energetic leadership by the University will point the way to even more far-reaching results than the full achievement of its own program will represent. We believe such leadership can be demonstrated by carrying out the expansion here proposed.

The accompanying material covers anticipated building construction and modernization by the University for the period ending 1955.

Prepared by Building Committee of Chicago Colleges.

SUMMARY OF PROJECTS

PROPOSED BY

COLLEGES OF MEDICINE, DENTISTRY AND PHARMACY

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Med. 1	Additions to General Hospital	$ 3,000,000	5
Med. 2	Atmospheric Environmental Research	500,000	11
Med. 3	Power Plant and Physical Plant Service Bldg.	1,500,000	14
Med. 4	Library, Museum, Auditorium	1,750,000	16
Med. 5	Nurse's Home	1,250,000	23
Med. 6	Women's Hospital	1,000,000	26
Med. 7	Isolation Hospital.	1,000,000	28
Med. 8	Gymnasium	1,000,000	30
Med. 9	Arboretum	150,000	33
Med. 10	Illinois Eye and Ear Infirmary	1,250,000	36
Med. 11	Student Residence Halls	3,500,000	39
Med. 12	Student Union Building.	750,000	42
Med. 13	Building Modernization	682,600[a]	45
Med. 13a	Relocate Central Supply	25,000	46
Med. 13b	Visiting Doctor's Locker Rooms	4,000	48
Med. 13c	Improvements in Illinois Surgical Institute for Children	3,000	50
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Med. 13e	Relocation of General Stores	40,000	54
Med. 13f	Rehabilitate Surgical Space	100,000	58
Med. 13g	Improve the Animal Hospital	62,000	60
Med. 13h	Remodel Administrative Offices	7,500	62

a Deduct $395,000 if Project Med. 1 is constructed.

Number		Estimated Cost	Page
Med. 13i	Improve Nurses' Home	$ 2,600	64
Med. 13j	Hospital Cubicles	36,000	66
Med. 13k	Ice Machines	8,500	68
Med. 13l	Improve Out-Patient Department Ventilation	50,000	70
Med. 13m	Ventilate Hospital Wards	65,000	72
Med. 13n	Terra-Cotta Wainscoting in General Hospital	80,000	74
Med. 13o	Enclose Porches on Second and Third Floors of General Hospital	3,000	76
Med. 13p	Acoustical Treatment in General Hospital	10,000	78
Med. 13q	Co-ordinate Laboratory and Office Space	86,000	80
Med. 13r	Enlarge Dental Laboratories	50,000	82
Med. 13s	Corridor Exhibit Cases	10,000	84
Med. 13t	Pharmacognosy Greenhouse	10,000	86

PROJECT MED. 1

ADDITIONS TO THE GENERAL HOSPITAL

I. DEPARTMENT LOAD

Justification for the hospital additions rests chiefly upon the fact that present clinical teaching facilities are inadequate for the large student body which the University now has in the College of Medicine. Statistical justification of this conclusion appears in section II.

Certain features of student enrollment do have a bearing on the need for hospital additions. At the present time the Colleges of Medicine and Dentistry have a capacity enrollment and would, therefore, be unable to accommodate an increased student body after the war. The College of Pharmacy now has approximately one-third the students it can accommodate and will, therefore, be capable of absorbing the remaining two-thirds after the war.

An increase of the student body after the war would place upon the academic and clinical teaching facilities and upon the present staff a teaching load which neither of these is designed to carry.

Since the College of Medicine is already the largest in the United States, it is our judgment that no great increase in student enrollment should be anticipated or provided for by the University of Illinois, at least until adequate clinical hospital teaching facilities have been provided for the present teaching requirements.

Special emphasis should be given the fact that the hospital additions are proposed primarily to improve the general services for medicine, obstetrics and gynecology, and pediatrics. It is recognized that the integrated teaching program should be strong in these four basic departments. The present assignment of hospital beds leaves a relative deficiency for these general services and gives a disproportionate allotment to certain specialties.

Correcting this discrepancy will give a curriculum more nearly in balance and strengthen the basic integrated teaching facilities.

II. PRESENT SPACE

The present General Hospital, built in 1923 with six stories and basement, has a gross floor area of 191,000 square feet and a net useable floor area of 160,900 square feet. The building is reinforced concrete frame, fireproof construction. In the twenty years of its life it has experienced the maximum of depreciation as well as functional obsolescence. The program contemplates modernization of the greater portion of the present space as well as the addition of new space. Special emphasis should be placed on the depreciation of the mechanical services. The condition of the piping and electrical wiring is such that practical replacement of piping, conduit, duct work, valves, pumps, fans, cut-out boxes, and all such related items will be necessary to permit the present building to continue as a functioning hospital and to bring its services up to date. Such a program of modernization is essential even without the addition of new space.

The present hospital provides 240 hospital beds. This, when added to the beds available in other University-controlled hospitals and institutes, gives a total of 567 hospital beds, or 1.6, for each third-and-fourth-year medical student. This figure is below the average of 2.0 for the lowest ten medical schools listed in the American Medical Association report titled "Medical Education in the United States, 1934-1939". When added to the 3.9 beds per student available to the University for teaching in the affiliated hospitals, Cook County and Presbyterian, this figure gives a total of 5.5 which is still below the average of all schools covered in this report. The average of the ten highest schools listed in the report was 10.3.

The shortage of clinical teaching facilities is in a measure a reflection of the general conditions in this area. The total of hospital beds available in the several general public hospitals under Cook County administration is 3,400. New York City with a population approximately twice that of Cook County has a total of 11,000 public hospital beds. By comparison, Cook County should have 5,500 such beds instead of the 3,400 existing.

From these statistics it can be seen that the clinical teaching facilities at the present time are well below standard.

III. POST-WAR DEVELOPMENT

As implied in I and II, the program proposes to bring the University teaching facilities up to a level near or slightly above the standard for the country.

Changes in post-war teaching will be reflected in distribution of students among the three colleges and in changes in teaching techniques made possible by adequate clinical facilities.

An increase is anticipated in the service staff, including nursing, dietary, and so forth, and in the teaching staff as a result of the additional hospital beds.

IV. PROPOSED NEW SCHEME

The proposed scheme adds a total of 210,000 square feet and 300 hospital beds and will cost an estimated $3,000,000.00. The building is to adjoin the east end of the present hospital and to be connected to the present building and to the present academic building. The construction will be fireproof with a concrete frame. It is the intent of the

design to provide a building in which not only the required hospital services can be given but in which it will also be possible to set up experimental conditions requiring special control of heat, ventilation, light, or other physical conditions for treatment and study. The concept is of a building which will be a teaching and clinical research laboratory as well as an efficient service hospital. In addition to such provision for all hospital space, certain space areas will be equipped with facilities for an even greater range of temperature and pressure control.

The present out-patient space is inadequate and results in congestion and unsatisfactory teaching facilities in connection with treatment given ambulatory patients. The proposed additions will provide adequate space and permit satisfactory teaching as well as some increase in service to out-patients. The proposed scheme permits centralization of laboratory and other adjunct services to give higher efficiency and better service. The proposed scheme also provides an emergency surgery unit, facilities for atmospheric research, including aviation medicine, improved physical medicine therapy and occupational therapy departments, improved radiology and improved food service and adequate building service areas for the combined existing and proposed general hospital space.

Completion of this project will bring the clinical teaching facilities of the University up to an acceptable standard and will put the Chicago Colleges in a position to consider forward-looking plans for improvement.

The estimated cost of the project is as follows:

1.	Landscaping and Utilities	$ 20,000.00
2.	Improving present space	480,000.00
3.	New building	2,250,000.00
4.	Equipment	250,000.00
	Total	$ 3,000,000.00

V. FUTURE DEVELOPMENT

The proposed additions will round out the total development of the present General Hospital. Future development will consist of separate buildings to house special institutes such as a Women's Hospital, Isolation Hospital, and the Illinois Eye and Ear Infirmary. When such institutes are built, the services now housed in the General Hospital will be moved to the new institutes, thus freeing space for future expansion of the General Hospital. It is anticipated that the services of Medicine, Surgery, and Pediatrics will remain in the General Hospital in the ultimate plan.

VI. SUMMARY

1. The Chicago Colleges of Dentistry, Medicine and Pharmacy do not anticipate large increases of enrollment in the post-war period. The principal need is for provision of adequate clinical teaching facilities for the number of students now enrolled and anticipated in the future.

2. The present clinical teaching space is inadequate in size and obsolete. This condition places the University near the bottom of the American Medical Association list when measured by clinical teaching standards.

3. Post-war development will be principally in the field of improved clinical teaching, made possible by increased facilities.

4. The Hospital additions provide adequate clinical teaching space and proposed modernization of the present obsolete facilities.

5. Future development will consist of branching out into separate Institutes rather than further development of the General Hospital.

Prepared by Building Committee of Chicago Colleges.

PROJECT MED. 2

ATMOSPHERIC ENVIRONMENTAL RESEARCH

I. DEPARTMENT LOAD

The present program of Atmospheric Environmental Research has demonstrated the opportunities which exist for research in this field. The present program is only a beginning.

II. PRESENT SPACE

The research experiments are now housed in a section of the General Hospital, occupying approximately 4,500 square feet. A portion of this space has been equipped with equipment for special atmospheric control needed for the research. An attempt to develop further research projects within the present hospital building would result in a conflict between the research and hospital functions. It has also been necessary to encroach upon the mechanical service space of the hospital to provide equipment required by the experiment. Further expansion of the mechanical units would also be difficult. Space limitations make imperative plans for housing Atmospheric Environmental Research in a separate space.

III. POST-WAR DEVELOPMENT

It is anticipated that the development of air transportation in the post-war period will call for continued Atmospheric Environmental Research of the type already undertaken and extension of the program to other related fields. The over-all University program of teaching and research in aeronautics will center most of the important biological research phases of aviation medicine and related subjects in the Illinois Medical Center. This work will, however, be closely correlated with the

other experimental aviation program to be carried out in Urbana. Some of the work being done in Chicago will involve engineering research as well as medical research, on which correlation of the work will be essential.

IV. PROPOSED NEW SPACE

It is proposed that special research projects be housed in a separate space as closely connected to the General Hospital as may be possible. The general plan for development will be better served if such research can be housed in a separate building but the desired relation of the research to hospital patients implies a relatively close physical condition. The building proposed will contain approximately 20,000 square feet of floor area and the project will cost an estimated $500,000.00. Special provision is to be made for control of temperature, pressure, air movement, humidity, air cleanliness, and probably other factors which will appear as the research progresses. Provision for special space for Atmospheric Environmental Research will free the section of the hospital now devoted to that project. The plans for the hospital additions presume that this space will be available for hospital use.

V. FUTURE DEVELOPMENT

One of the factors which suggests most strongly the housing of Atmospheric Environmental Research in a separate building is the opportunity in such cases to plan for expansion in the distant future. Development of the present land around the General Hospital and proposed additions is of relatively high degree of land coverage. This, in turn, will make it more difficult to provide for future expansion than would

be the case with a building located on its own site.

The proposed plan locates Atmospheric Environmental Research so that expansion which may become necessary in the future will be possible. It is estimated that the proposed accommodations will serve the probable requirements for a period of thirty years.

VI. SUMMARY

1. The present work being done under Atmospheric Environmental Research is only a beginning.

2. The present space is adequate for the present program but will need to be greatly expanded in the future.

3. The future anticipates far more extensive research in the field of atmospheric control.

4. A new building is proposed to provide 20,000 square feet of floor area and cost approximately $500,000.00.

5. Provision will be made in site-planning for future expansion of this service.

Prepared by Building Committee of Chicago Colleges.

PROJECT MED. 3

POWER PLANT & PHYSICAL PLANT SERVICE BUILDING

I. DEPARTMENT LOAD

The present power plant, built in 1925 and extended in 1937 and 1941, provides steam for the present academic building and for the Research and Educational Hospitals. It is obvious that increase in size of the buildings in the Illinois Medical Center will at some point require an increase in power plant facilities.

II. PRESENT SPACE

Consideration has been given to the possibility of improving and expanding the present power plant. The size and condition of this plant are such that additions and improvements would be difficult to make without loss of efficiency in layout and in operation. Its location relative to the future development of the Illinois Medical Center also discourages development of the present building.

Calculations show that the proposed hospital additions can be carried with the present plant provided new auxiliary services are installed. If any other building project is undertaken, a new power plant will be needed.

III. POST-WAR DEVELOPMENT

Increase of load as indicated under paragraph 1.

IV. PROPOSED NEW SPACE

The new building is intended to house the steam generating unit, a new laundry, and Physical Plant shops and offices. Estimated cost of

the entire project is $1,500,000.00.

The location proposed is on the south side of Taylor Street, east of Hermitage and west of the Elevated. This location was selected to free the central section of the proposed campus for academic and hospital buildings and to permit securing coal by rail if arrangements can be made with the Elevated for doing so. The location is near the southeast corner of the area designated for the Illinois Medical Center.

The plant is to be designed to ultimately serve all buildings proposed for the Illinois Medical Center, a total of 16 new buildings, costing an estimated $23,000,000.00.

V. FUTURE DEVELOPMENT

The plant is thus planned to take care of the full future development of the Illinois Medical Center. Location on the site will permit later expansion if required.

VI. SUMMARY

1. Proposed additions to the General Hospital and building of other new buildings require construction of a new power plant.

2. Proposed campus development makes it inadvisable to expand the present power plant.

3. The proposed plant is to take care of the ultimate development of the Illinois Medical Center.

4. A new power plant and Physical Plant service building is proposed, to cost an estimated $1,500,000.00.

5. Location on the site will permit later expansion if required.

Prepared by Building Committee of Chicago Colleges.

PROJECT MED. 4

LIBRARY, MUSEUM, AUDITORIUM

(Visual Education Building)

I. DEPARTMENT LOAD

The building plan for this project is to house the three related groups named in the title. Of these, the library is the only group on which data covering operations at the University are available. Data for the Museum and Auditorium use are, therefore, being calculated from standards which are available.

Great progress has been evident in the use of visual materials as educational aids in the past decade. Experience which we are now gaining in the armed services will accelerate the growth of visual education and it will result in post-war requirements for visual aids beyond anything we have had or now anticipate.

The need for this building, therefore, results from a known growth in the Library portion and a practically certain increase in the need for the Museum and Auditorium facilities.

All three facilities are to be coordinated, both physically and administratively, so far as their effective functioning will permit.

II. PRESENT SPACE

1. Library: The present library contains 80,000 volumes and occupies 17,500 square feet of floor area. This area is located at one point on the basement and first floors of the Dental, Medical, and Pharmacy building. It serves a total reading group of approximately 2,000, including 1200 students and 800 staff members.

The central location of the library represents a real advantage. Limitations of construction and function prevent adequate expansion of the library service within the present building. The expansion which has been witnessed through the past ten years has already resulted in a spreading of the library service which not only causes inefficient library operation but represents an encroachment upon the space designed for other use. An actual physical limitation was reached in 1940 beyond which expansion in the present space is impossible.

2. Museum: The University possesses a considerable volume of display material which cannot well be combined with the library material. This is in the form of drawings, models, wet sections, microscopic sections, photographs, and micro-films. At the present time, it is displayed at two rooms in the D.M.P. Building and installed in a few corridor display cases. Material is also being used in certain hospital units including obstetrics in which the cabinet displays are simply placed in the hospital corridors. This gives the desired closeness to the clinical teaching material but produces an undesirable physical condition since the corridors were not designed for this use. A liberal estimate of the present floor space devoted to museum use is 4,300 square feet.

It is proposed that the museums now existing be continued at least until it has been demonstrated that they no longer serve a useful purpose and that the new Visual Education Building be designed to take care of a very much greater number of exhibits which the University possesses or which are available to the University but for which no display space now exists. Housing the exhibits in the Visual Education Building

will free a certain amount of storage space in the present buildings and it may eventually release some of the present museum space.

3. Auditorium: The University now possesses six lecture rooms with a total floor area of 10,200 square feet and a total number of 957 seats. Available in the Illinois Neuropsychiatric Institute and in the Institute for Juvenile Research are two additional lecture rooms with a total floor area of 2,400 square feet and a total number of 175 seats. This gives a grand total for the Illinois Medical Center of 8 lecture rooms with a floor area of 12,600 square feet and 1132 seats. The largest of the lecture rooms is located in the D.M.P. Building and contains 390 seats. There is thus available no auditorium for such functions as Commencements and larger public meetings. The location of the lecture rooms within the school building makes them difficult of access for the public, especially at night. For that reason, the proposed building includes an auditorium seating 1500 which will be so located that public use, as well as University use, will be possible. It is probable that a lecture room seating 250 people will be specially equipped for the use of visual materials. These provisions will not replace any of the existing lecture rooms but will permit, in the one case, the housing of large assemblies at the University instead of in Public Halls remote from the University as at present and, in the other case, the display of material not now shown in the University lecture rooms.

At no point in the Medical Center District is there an auditorium satisfactory for public meetings and for meetings of scientific and professional associations. Such an auditorium might well serve as a community assembly center for the entire Medical Center District as well as for the smaller group known as the Illinois Medical Center. Such ser-

vice would be in addition to the service it would render the University of Illinois teaching program which in itself is felt to justify the building.

4. Miscellaneous: The space now devoted to library and museum administration and to the illustration studios and photographic studios is inadequate. It is proposed that all such work be coordinated in the new building and directed towards expansion of the museum function. This re-location will free certain space in the basement of the D.M.P. Building for storage or other academic use.

III. POST-WAR DEVELOPMENT

The plans for post-war development in Visual Education under the three general functions are as follows:

1. Library: Increased use of printed material in connection with other visual material is anticipated. It is hoped that the new building will encourage such coordinated use and make existing library material more used than it is at present.

2. Museum: Extensive expansion of display material is proposed. This will require the development of the present illustration studios, photographic studios, and display spaces into a unified working department.

The University of Illinois now enjoys energetic leadership in the field of Medical Illustration and related graphic materials. Expansion of the present studio and work space to take full advantage of the existing University personnel is contemplated as part of the program.

3. Auditorium: The increase in community activity which is anticipated as part of the development program for the Illinois Medical Center and for the larger Medical Center District calls for a public

meeting room in which modern visual materials can be used. The development of a community health service, envisioned as part of the program, would justify such an assembly hall.

IV. PROPOSED NEW SPACE

1. Library: The proposed library portion of the Visual Education Building is designed to accommodate about 300,000 volumes and will require approximately 58,000 square feet of floor area.

It is estimated that the present rate of accession of 20% for each five years plus 1,000 gift volumes per year will result, at the end of thirty years, in a library of 300,000 volumes. The estimated increase in the reading group for the 30 year period brings the total to 2800, including 1800 students and 1000 staff members.

The building is to contain a Reading Room, a Reserve Reading Room, a Browsing Room, adequate stock space, Circulation Desk and Lobby space, Cataloging and other work rooms, and the necessary service areas.

2. Museum: The plan of the museum space is predicated upon a series of seminars approximately 20 x 26' which will contain unit cases with visual displays on related subjects. The proposed museum space will require 28,000 square feet. The building is to be located on the property south of Polk Street and between Wolcott Avenue and Winchester Street. The elements will be related to the present academic and hospital buildings to permit a maximum of accessibility for students as well as to give the proper orientation. Provisions for future expansion will be made. Provision will also be made in the seminars for storing books if desired. Popular displays will be located in corridors and other public spaces so as to attract the public attention as well as serve the students. Work

space will be assigned to the illustration studios, photographic studios, carpentry shop, plaster shop, and other service functions. The unit display case is designed to permit inter-changing any and all material, thus giving a flexibility which it is hoped will be used to keep the displays up to date and functioning. Special provision will be made for projection of visual material and for the viewing of micro-films.

The arrangement of the teaching museum seminars and the library reading rooms will be such that a close relationship between these two functions can be developed if desired without loss of essential privacy.

3. Auditorium: The proposed auditorium is to adjoin the library museum space sufficiently close to serve for student assembly as much as required but sufficiently remote to permit public assembly without interference of student activity in the library and museum. The auditorium will be designed with 1,500 seats for the particular use of visual materials. Emphasis will be placed on projection rather than upon traditional stage activity. The resultant building requires a gross floor area of 134,000 square feet and will cost an estimated $1,750,000.00.

V. FUTURE DEVELOPMENT

The plans for this project contemplate a development for the next 30 year period. Because of the experimental character, however, of the museum portion of the project, no definite measure of its future growth can be established at this time. It is, therefore, proposed that the plan be sufficiently flexible to permit changes within the structure and, if necessary, future expansion of the structure to accommodate changing requirements as they occur.

VI. SUMMARY

1. (a) Library service to continue.

   (b) Museum service to be greatly expanded.

   (c) Auditorium service to be provided.

2. (a) The present library area is too small and its location does not permit expansion.

   (b) The present museum area is inconsequential by the standard of the proposed museum program.

   (c) The present general auditorium does not exist.

3. (a) Post-war expansion of the library service is anticipated.

   (b) Extensive post-war expansion of the Museum function is planned.

   (c) Provision of a general auditorium is contemplated.

4. (a) A library for 30,000 volumes totalling 58,000 square feet floor area is planned.

   (b) A museum of 28,000 square feet is planned.

   (c) An auditorium seating 1,500 with a floor area of 39,000 square feet is planned.

   (d) Administrative and service space totalling 9,000 square feet is to be included.

5. The site plan will permit expansion in the future if that is required.

Prepared by Building Committee of Chicago Colleges.

PROJECT MED. 5

NURSES' HOME

I. DEPARTMENT LOAD

The Research and Educational Hospitals personnel includes approximately 130 graduate nurses and 10 female resident physicians. No School of Nursing has yet been established.

It is anticipated that the increase in hospital services, including the proposed additions to the General Hospital, will require an additional 70 graduate nurses, bringing the total to 200.

Definite plans are also being made to establish a School of Nursing connected with the University of Illinois. At this school the anticipated enrollment for the first three years is as follows:

First year:	50 students	50
Second year:	1st year students	50
	2nd year students	50
		100
Third year:	1st year students	50
	2nd year students	50
	3rd year students	50
		150

This brings the estimated total of students and graduate nurses to 350. The inclusion of a School of Nursing as part of the University will meet a long felt need and will tend to round out the over-all teaching program.

II. PRESENT SPACE

The Research and Educational Hospitals include a nurses' home, built in 1929, four stories and basement, concrete frame, fireproof build-

ing containing rooms for 80 nurses, together with general lounges and service rooms but no general kitchen or dining room facilities.

III. POST-WAR DEVELOPMENT

The proposed development of the Illinois Medical Center contemplates re-assignment of this building to some institutional use, possibly a temporary isolation unit, and ultimate removal of the building after it has served its period of usefulness. The material on the post-war development of the nursing school and increase in nursing requirements is given in paragraph one.

IV. PROPOSED NEW SPACE

The building proposed is to contain 300 beds and will be of fireproof construction on the east side of Wood Street, north of Taylor Street. The building will be similar in character to the Residence Halls proposed for the medical students, taking into account the different requirements of nurses. Provisions will be made for separate sections assignable to student and graduate nurses, if that separation is found desirable. It is presumed that the feeding of student nurses will be provided for in the General Hospital instead of in the Nurses' Home. Lounges and other service space will be provided but more specialized recreation facilities will not be included since it is estimated they will be available in the student Union Building or in the gymnasium recreation building proposed.

V. FUTURE DEVELOPMENT

The plans contemplate provision for development for the next fifteen years. It is anticipated that increases of later date can be provided for by expansion of the Nurses' Home in its proposed location.

VI. SUMMARY

1. The present Nurses' Home accommodates 80 of the 130 graduate nurses. Completion of the proposed General Hospital additions will increase the total of graduate nurses to 200. Establishment of a School of Nursing will add an ultimate 150 student nurses, giving a gross estimated future total of 350.

2. The present space is inadequate for such a total and its location suggests conversion to hospital use instead of residential use.

3. The post-war development includes expansion of the existing graduate nursing service and establishment of a whole new department, a School of Nursing.

4. The proposed building is planned to accommodate 300 of the estimated 350 total nurses. Certain graduate nurses prefer to live away from the institute.

5. Additional development beyond 15 years post-war has not been estimated. Site planning will permit building expansion if it becomes necessary.

Prepared by Building Committee of Chicago Colleges.

PROJECT MED. 6

WOMEN'S HOSPITAL

I. DEPARTMENT LOAD

The present hospital services in Obstetrics and Gynecology are rendered in the General Hospital under a single department head. It is anticipated that the expansion of the General Hospital proposed will be reflected in an increase of hospital beds assignable to the women's services from 47 (plus 34 bassinets) to 130 (plus 60 bassinets). A further gradual increase of these services to an estimated total of 150 beds will ultimately justify the building of a separate hospital for women.

II. PRESENT SPACE

The women's services are now located in the General Hospital building in space originally designed for general medicine. Additions to the hospital will provide for expansion of Obstetrics and Gynecology into space originally designed for Psychiatry. Even with proposed improvement of these spaces no completely satisfactory arrangement can be made in the present building to take care of the women's services.

III. POST-WAR DEVELOPMENT

It is therefore proposed that a separate hospital be erected devoted exclusively to the women's services.

It is possible that this project may be carried out in cooperation with other agencies interested in maternal welfare. If this is done, there will be a sharing of cost of development as well as use of services.

IV. PROPOSED NEW SPACE

The proposed building contemplates 150 hospital beds, provision of necessary delivery and operating rooms and a section devoted to out-patient service.

V. FUTURE DEVELOPMENT

The proposed plans contemplate provision for the 15 years post-war. No estimates have been made of later expansion. The location of the Women's Hospital on the building site will permit expansion of the building if future requirements justify.

VI. SUMMARY

1. Additions to the General Hospital will result in expanded load for the Women's Hospital. A slight increase in succeeding years is also anticipated.

2. Present facilities are obsolete and inadequate. Modernization of these facilities will serve for a time but will never give a completely satisfactory service.

3. An increase in load from the present 47 to an estimated 150 beds is anticipated for these services.

4. A separate Women's Hospital building is proposed, providing 150 beds at an estimated cost of $1,000,000.00. The building is to be located on the east side of Wood Street, north of Taylor Street and south of the present Illinois Neuropsychiatric Institute.

5. Location of the site will permit future expansion.

Prepared by the Building Committee of Chicago Colleges.

PROJECT MED. 7

ISOLATION HOSPITAL

I. DEPARTMENT LOAD

The present Research and Educational Hospitals do not provide a separate unit for contagious diseases. Such cases when discovered are isolated within individual hospital bedrooms until they can be transferred to other hospitals. While the City and County maintain contagious hospital services which are used for teaching purposes, they do not fully meet the demand in this area.

As the growth of the Illinois Medical Center approaches its ultimate total of 1,000 hospital beds, a unit for contagious diseases located within the Center becomes more essential. In a Medical Center of the size contemplated all known standards call for the inclusion of a contagious disease unit to permit efficient hospital service operation and to support the teaching program.

II. PRESENT SPACE

No space is now assigned to an isolation unit in the Research and Educational Hospitals.

III. POST-WAR DEVELOPMENT

It is anticipated that the post-war period will see not only the normal requirements for a contagious disease hospital but also abnormal requirements resulting from the transplanting to this country of certain foreign contagious diseases brought by returning soldiers. In spite of the extreme efforts which are being made to avoid such transferring of diseases, it is likely that the load of contagious cases will be considerably larger.

The University has already developed a war-time program of teaching and research in tropical medicine. It is proposed to continue this program and expand it if required in the post-war period.

IV. PROPOSED NEW SPACE

An isolation building is proposed to provide 160 hospital beds and necessary adjunct services. No out-patient service is contemplated. The building is to be located on the east side of Wood Street, south of Taylor Street, and will cost an estimated $1,000,000.00.

V. FUTURE DEVELOPMENT

The proposed program provides for 15 years post-war. No estimates have been made covering the period after that time. Location of the building on the site will permit expansion which may be required in the future.

VI. SUMMARY

1. The Research and Educational Hospitals are not equipped to hospitalize contagious disease cases requiring isolation. Anticipated post-war load of isolation cases is greater than the present normal.

2. There is no present space for this service.

3. The post-war requirements justify a separate isolation hospital.

4. A building is proposed containing 160 hospital beds and costing an estimated $1,000,000.00.

5. Site planning will permit for expansion in the future if required.

Prepared by Building Committee of Chicago Colleges.

PROJECT MED. 8

GYMNASIUM

I. DEPARTMENT LOAD

The present recreation program is carried on in the Chicago Illini Union Building which provides a gymnasium, an exercise room, shower and locker rooms, for physical education, and meeting rooms for other parts of the recreation program. Vacant property at the southwest corner of Wolcott Avenue and Polk Street has been surfaced with crushed stone and is used as an athletic field and drill field. Great improvements have been made in the physical education program since it was started in 1941 but considerable further development is needed and is anticipated for the post-war period. Such development will require added physical facilities.

II. PRESENT SPACE

The present space in the Chicago Illini Building is inadequate for the over-all program anticipated. The gymnasium is too small for a satisfactory basketball game and becomes, therefore, principally a drill or exercise room. There is no swimming pool accommodation nor provision for small athletic rooms such as wrestling rooms, boxing, fencing, and so forth. The playing field is too small to permit more than one principal activity at a time which is a definite drawback in college intramural sports. The present program is entirely intra-mural in character.

III. POST-WAR DEVELOPMENT

A slight increase in the student body is anticipated in the post-war period and further development of the program itself. The

ultimate plan proposed a new Student Union Building adjoining the Student Residence Halls and Nurses' Home and transfer of all student extra-curricular activities now housed in the Chicago Illini Union Building to the new Union and to the gymnasium. This will free the present Union Building for use by other groups in the Medical Center District and possible transfer or sale.

IV. PROPOSED NEW SPACE

The gymnasium recreation building includes a large gymnasium, swimming pool, some bowling alleys, lounge, and soda fountain, and the necessary locker, shower rooms, and other service spaces. The estimated cost of $1,000,000.00. It is to be located on the north side of Taylor Street between Wood Street and the Elevated. The site is planned to include an athletic field adjoining the gymnasium and the Student Residence Halls.

V. FUTURE DEVELOPMENT

Site planning will permit extension of the proposed building to take care of needed future expansion and extension of the athletic field facilities to the east. It is estimated that the proposed development will take care of probable requirements for the next thirty years.

VI. SUMMARY

1. The present program does not provide full recreationsl service.

2. Present space is inadequate for the program and should be extended with the expanding program.

3. A post-war program is planned to give full service to the student body.

4. New facilities in the form of a gymnasium recreation building and adjoining athletic field are proposed.

5. Site planning will permit later expansion as required.

Prepared by Building Committee of Chicago Colleges.

PROJECT MED. 9

ARBORETUM

I. DEPARTMENT LOAD

The College of Pharmacy working chiefly through its Department of Pharmacognosy, makes extensive and continued studies of the problems connected with drugs. This includes studying the development and improvement of domestic plants for use in drug manufacturing. Wartime limitations on transportation have stimulated research in this field, and experiments have already been made leading toward greater production of domestic drug plants.

II. PRESENT SPACE

The College has enjoyed the cooperative use of facilities of the University of Illinois College of Agriculture at their experimental farm located southwest of DesPlaines, Illinois. For several years approximately two acres have been under cultivation for drugs. No facilities exist on this farm for satisfactory drying of drugs, and the arrangement does not give complete facilities either to the College of Pharmacy or to the College of Agriculture. Development of the Dodge Aircraft Factory has produced a land condition in the district which prevents satisfactory expansion of the present farm. Analyses show also that the soil in that locality is not the best for drug research. For these and other reasons, it has been concluded that a separate experimental unit will be more satisfactory to all parties concerned than the expansion of the present combined unit.

III. POST-WAR DEVELOPMENT

It is anticipated that the research on domestic drug plants will be continued and expanded after the war and for many years to come. Development of this research is one of the items in the future program of the College of Pharmacy.

IV. PROPOSED NEW SPACE

The proposed project contemplates leasing from the Morton Arboretum, located southwest of Glen Ellyn, 44 acres for a long term with provisions for erecting necessary buildings on the property and development of the land for drug research. The Morton Arboretum has indicated its willingness to entering into such an arrangement with the University of Illinois, and the College of Pharmacy expects to submit at an early date a detailed report covering the subject more fully. For the purpose of these estimates it was anticipated that a laboratory building, space for drying, storing, handling, and other manufacturing operations, and some housing for caretakers would be provided. The estimated cost of the project is $160,000.00.

V. FUTURE DEVELOPMENT

The plans proposed should provide facilities for development of this service for thirty years after the war. It seems likely that any such development would work in with future plans which the University may have.

VI. SUMMARY

1. The College of Pharmacy makes extensive and continuing studies of plants for drug manufacture.

2. It now shares farm space with the College of Agriculture on its experimental farm near DesPlaines, Illinois.

3. Further development of research in domestic plants for drug manufacture is anticipated after the war.

4. This project proposes an arrangement with the Morton Arboretum for establishing a research unit on their property.

5. The project will serve the future development of the University.

Prepared by Building Committee of Chicago Colleges.

PROJECT MED. 10

ILLINOIS EYE AND EAR INFIRMARY

I. INTRODUCTION

The University is concerned with this building project through its close relation to the State of Illinois Department of Public Welfare which owns and operates the present Illinois Eye and Ear Infirmary. The University of Illinois supports the proposed new building but assumes that the department of Public Welfare will initiate the planning for it.

II. DEPARTMENT LOAD

On July 1, 1943, the University of Illinois assumed administrative control over the professional staff and nursing staff of the Illinois Eye and Ear Infirmary. It is anticipated that the future will see a continued growth of the close working relationship between this unit of the Department of Public Welfare and the University of Illinois. It is hoped that such relationship can be developed further by the inclusion of a new building for the Illinois Eye and Ear Infirmary as part of the general development plan for the Illinois Medical Center.

III. PRESENT SPACE

The Illinois Eye and Ear Infirmary now occupies its own building on Adams and Sangamon Streets in Chicago, containing approximately 150 beds. It is anticipated that moving the infirmary to the Illinois Medical Center will free this building for other medical or welfare use.

Since the infirmary is not closely identified with the General Hospital the services rendered its patients are not as well balanced as they would otherwise be.

IV. POST-WAR DEVELOPMENT

The coordination of all medical services employed in the general development plan for the Illinois Medical Center will be greatly improved by the inclusion of the Illinois Eye and Ear Infirmary in that group of medical institutions. No great increase in the staff of the Infirmary itself is anticipated but the over-all service available within the Medical Center will be increased by the gross amount of hospital beds and medical staff available through the Illinois Eye and Ear Infirmary.

V. PROPOSED NEW SPACE

It is proposed that a separate building be located on the Taylor Street frontage providing 150 hospital beds with complete adjunct services and out-patient department. The estimated cost of the total project is $1,250,000.00. It is contemplated that the present departments of Ophthalmology and Otolaryngology will be housed in the new Infirmary and the space now occupied by them in the general hospital building freed for use of other hospital services.

VI. FUTURE DEVELOPMENT

No estimate has been made of development of this service beyond the fifteen years after the war. The building will be located on the site in such a way that expansion at that time may be made if required.

VII. SUMMARY

1. The present departments in the General Hospital and in the Illinois Eye and Ear Infirmary provide a service approximately of the size

anticipated for the post-war. Coordination of the service is planned rather than large increase in service.

2. The present space in the General Hospital is not adequate for the service rendered. The present space in the Illinois Eye and Ear Infirmary needs major rehabilitation to serve a continuing program. Its location remote from the Illinois Medical Center suggests the inadvisability of such changes if a new location is to be contemplated.

3. Post-war plans contemplate coordination of service and location of all service within the Illinois Medical Center.

4. A separate building is proposed to house the coordinated functions.

5. Site planning will permit expansion of this service in the distant future if that is required.

Prepared by Building Committee of Chicago Colleges.

PROJECT MED. 11

STUDENT RESIDENCE HALLS

I. INTRODUCTION

The funds with which this project will probably be built will be secured through private financing rather than by appropriation of the state, and it is anticipated that operation of the Residence Halls will be self-supporting if not self-liquidating. The University is concerned with the building project, however, since it will want to maintain control over the residence hall operations and may assist in acquiring necessary land. The arrangement proposed is similar to that now in effect on the Urbana campus.

II. DEPARTMENT LOAD

The normal student body, totalling approximately 1,250, is provided with a very limited amount of organized housing. The five medical fraternities have accommodations for 108 students in their houses located along Ashland Boulevard about three blocks east of the University. The professional Y.M.C.A. with 700 rooms offers modern housing facilities to individual students. This housing, however, is shared with other professional people in the area and lacks the desired element of student control. All other students live either in rented rooms or apartments throughout the city or live at home. It is estimated that there will be a slight increase in the total enrollment in the post-war period but the principal need is for organized housing to take care of a reasonable portion of the students.

III. PRESENT SPACE

The fraternities referred to accommodate 108 students in quarters which are not modern in construction or plan. It is likely, however, that the provision of student residence halls on the campus itself would not result in elimination of the fraternity buildings, at least during the early stages of the residence hall development. Taking all housing facilities together still provides total facilities which are not adequate.

IV. POST-WAR DEVELOPMENT

The general development of the plan for the Illinois Medical Center in the post-war period calls for building student residence hall units at the same time as other buildings.

V. PROPOSED NEW SPACE

The program for residence hall development contemplates an ultimate provision of 644 beds, costing a total of $3,500,000.00. The provision of centralized organized housing is expected to aid in developing a greater consciousness of University unity among the students. The total cost includes a disproportionate amount of food service cost and provides some service for transient guests. The estimated cost of the Student Union Building will be reduced by the inclusion of these services in the cost of the proposed residence halls.

VI. FUTURE DEVELOPMENT

The residence halls proposed are intended to take care of reasonable requirements for a thirty-year period after the war. The

buildings are being planned, however, so that extensions can be made if requirements in the distant future justify.

VII. SUMMARY

1. The present student body is expected to expand somewhat after the war.

2. Inadequate accommodations for the students now exist.

3. Post-war plans include providing organized housing for students.

4. A residence hall containing 800 beds, costing an estimated $3,500,000.00 is proposed.

5. Site planning will permit for expansion if required.

Prepared by Building Committee of Chicago Colleges.

PROJECT MED. 12

STUDENT UNION BUILDING

I. INTRODUCTION

The funds with which this project will probably be built will be secured through private financing rather than by appropriation of the state, and it is anticipated that operation of the Student Union Building will be self-supporting if not self-liquidating. The University is concerned with the building project, however, since it will want to maintain control over the Student Union Building operations and may assist in acquiring necessary land. The arrangement proposed is similar to that now in effect on the Urbana campus.

II. DEPARTMENT LOAD

Membership in the Chicago Illini Union includes the full student body, the faculty, and staff. It is anticipated that the increase in enrollment after the war will justify expansion of the Union program.

III. PRESENT SPACE

The building now occupied by the Chicago Illini Union is already inadequate for the present program. The general development plan calls for expansion of the Illinois Medical Center south of Polk Street. The present Union Building is the only unit not so located. For this reason, no future development of it is contemplated and it is probable that it will ultimately be transferred to the general community or some institutional group.

IV. POST-WAR DEVELOPMENT

Plans for development of the Illinois Medical Center call for a new Student Union Building as part of the Student Residence Hall group. Physical recreation facilities now provided in the Student Union Building are to be transferred to the Gymnasium and Recreation Building. All other Union functions will be provided in the proposed new Student Union.

V. PROPOSED NEW SPACE

The building proposed is to have general lounges, meeting rooms, restaurants, and other adjunct social spaces and will cost an estimated $750,000.00. It is to relate closely to the Student Residence Halls and may contain part of the food service for such halls. It is planned to become the extra-curricular center for student life.

VI. FUTURE DEVELOPMENT

The proposed plan is designed to take care of expansion for the thirty year period after the war. The design of the building will be such that future expansion will be possible when required.

VII. SUMMARY

1. The present Student Union service represents a satisfactory beginning.

2. The present space is inadequate for the existing program.

3. Expansion of the student body after the war will justify an increase in the Student Union program.

4. The proposed new building is designed to facilitate such an expanded program and will cost an estimated $750,000.00.

5. The site plan will permit expansion in the distant future if that is necessary.

Prepared by Building Committee of Chicago Colleges.

PROJECT MED. 13

BUILDING MODERNIZATION

		Estimated Cost	Estimated Years to Complete Program	Annual Budget Allowance	Deductible from Capital Building Improvements
a.	Relocate Central Supply	25,000	2	12,500	25,000
b.	Visiting Doctors locker room	4,000	1	4,000	4,000
c.	Improvements-Ill.Surg.Inst. for Children	3,000	1	3,000	
d.	Air Condition Obstetrical Dept	30,000	2	15,000	30,000
e.	Centralize General Stores	40,000	1	40,000	
f.	Rehabilitate Surgical Space	100,000	4	25,000	100,000
g.	Improve Animal Hospital	62,000	2	31,000	
h.	Remodel Administrative Offices	7,500	1	7,500	
i.	Improve Nurses' Home	2,600	1	2,600	
j.	Hospital Cubicles	36,000	1	36,000	36,000
k.	Ice Machines	8,500	1	8,500	
l.	Improve Out-patient Dept. Ventilation	50,000	2	25,000	50,000
m.	Ventilate Hospital Wards	65,000	2	32,500	65,000
n.	Terra Cotta Wainscoting	80,000	2	40,000	75,000
o.	Enclose Porches 2nd & 3rd floor Hospital	3,000	1	3,000	
p.	Accoustical Treatment	10,000	1	10,000	10,000
q.	Coordinate Laboratory & Office space	86,000	4	21,500	
r.	Enlarge Dental Laboratories	50,000	2	25,000	
s.	Corridor Exhibit cases	10,000	1	10,000	
t.	Pharmacognosy Greenhouse	10,000	1	10,000	
	Total Estimated Cost	682,600			
	Largest possible total any year			362,000	
	Deductible if additions to General Hospital are approved				395,000

Prepared by Building Committee of Chicago Colleges.

PROJECT MED. 13a

RE-LOCATE CENTRAL SUPPLY

I. DEPARTMENT LOAD

The present facilities serve all units of the Research and Educational Hospitals. Addition of the Illinois Neuropsychiatric Institute within the last two years has increased the load on this service. No accompanying increase in space or equipment was made.

II. PRESENT SPACE

Central Supply now uses one single-compartment wash sink for both sterile and non-sterile washing. Assurance of sterility under this condition involves repeated washings between each pair of different functions. Distilled water must now be transported some distance and dispensed from storage jars. This condition induces storing of distilled water longer than good practice allows since freshly distilled water is essential. The present storage space for sterile supplies is inadequate. The present location of Central Supply in the basement makes its service to surgery on the fourth floor (the most important single service rendered by Central Supply) unnecessarily difficult. Poor ventilation of the basement space also produces an undesirable working condition when the steam sterilizers are operating.

III. POST-WAR DEVELOPMENT

An increase in hospital service after the war will result in correspondingly increased demands on this department. Approval of the proposed hospital additions will eliminate the need for this project since those additions propose a location for Central Supply in the new building.

IV. PROPOSED NEW SPACE

In the event the additions are not built for some time, it is proposed to re-locate Central Supply on an upper floor of the present hospital building, providing them with adequate floor space, modernized equipment, and satisfactory working conditions. Existing sterilizers will be inspected, re-built, and re-located, if found to be satisfactory. Provision has been made in the estimate for adding one new autoclave. The estimated cost of re-location is $25,000.00.

V. FUTURE DEVELOPMENT

The only completely satisfactory future development will be a new department properly located in the hospital additions. If the present project is carried out, it is planned to design it so that a maximum of equipment can be salvaged for re-location at a later date.

VI. SUMMARY

1. The present Central Supply is already heavily loaded.

2. The present space is inadequate for the services to be rendered.

3. An increase in the load on Central Supply is anticipated for the post-war period.

4. The proposed project re-locates Central Supply and modernizes its equipment. It will not be necessary as a separate project if the hospital additions are made.

5. The future development should be toward a new service department.

Prepared by Building Committee of Chicago Colleges.

PROJECT MED. 13b

VISITING DOCTORS' LOCKER ROOMS

I. DEPARTMENT LOAD

It is estimated that in the neighborhood of 100 doctors visit the hospital each week for one purpose or another.

II. PRESENT SPACE

No locker room accommodations now exist to take care of these visitors. A small room adjoining the observation floor of the operating rooms is used for visitors to surgery but that does not take care of visitors to other departments.

III. POST-WAR DEVELOPMENT

Expansion of the educational program is expected to increase the number of visiting doctors.

IV. PROPOSED NEW SPACE

The plan is to provide an adequate locker room, washroom, and lounge, to take care of this need. It is estimated that this will cost $4,000.00. If the plan for hospital additions is carried out, this will not be necessary as a separate item.

V. FUTURE DEVELOPMENT

The only completely satisfactory development in the future is inclusion of this space in the new hospital.

VI. SUMMARY

1. The present load justifies space for a visiting doctors' locker room.

2. No adequate space now exists for this.

3. An increase in this need is anticipated after the war.

4. It is proposed to provide such space at a cost of $4,000.00. This will not be necessary if hospital additions are built.

5. Provision should ultimately be made for this in the new building.

Prepared by Building Committee of Chicago Colleges.

PROJECT MED. 13c

IMPROVEMENTS IN ILLINOIS SURGICAL INSTITUTE FOR CHILDREN

I. DEPARTMENT LOAD

The Illinois Surgical Institute for Children (the Orthopaedics Building) is a concrete frame and brick fireproof building providing 119 hospital beds. It was built in two sections; the first in 1923, and the second in 1936. It serves the State of Illinois in treating orthopaedic cases in children.

II. PRESENT SPACE

The present building is adequate in size to meet the program needs. Certain minor improvements are needed, however, to bring the older portions of the building up to date.

III. POST-WAR DEVELOPMENT

It is not anticipated that the post-war period will see a marked increase in the requirements on this service.

IV. PROPOSED NEW SPACE

The proposal made is for minor detailed improvements to the present building. This includes installation of curtain separations in certain wards; installation of a dividing partition in the schoolroom; enclosure of a roof-deck for summer time use; provision of protective bars on certain windows, and glass panels and other similar minor improvements. It is estimated that these improvements will cost $3,000.00.

V. FUTURE DEVELOPMENT

The ultimate plan for the Illinois Medical Center calls for only minor increase of this service.

VI. SUMMARY

1. No great increase in department load is anticipated.

2. The present space is adequate but needs minor improvements.

3. No large increase in the need is anticipated post-war.

4. Minor improvements proposed, costing an estimated $3,000.00, will modernize the older portion of the building.

5. The present plan will be satisfactory in the ultimate development.

Prepared by Building Committee of Chicago Colleges.

PROJECT MED. 13d

AIR CONDITION OBSTETRICAL DEPARTMENT

I. DEPARTMENT LOAD

The present Department of Obstetrics provides 30 adult beds and 34 bassinets. A slight increase in this load is anticipated.

II. PRESENT SPACE

The department occupies the second floor west section of the present General Hospital.

III. POST-WAR DEVELOPMENT

If plans for the hospital additions are not carried out, a minor increase only is anticipated in this department.

IV. PROPOSED NEW SPACE

This project proposes installation of complete air conditioning (heating, cooling, humidifying, de-humidifying, cleaning, and air movement) in the present space including wards, delivery rooms, and all adjunct rooms. The estimated cost of the installation if $30,000.00.

V. FUTURE DEVELOPMENT

Plans proposed elsewhere include provision in the hospital additions for an Obstetrical service and later the housing of that service in a Women's Hospital. Carrying out these plans will make this project unnecessary.

VI. SUMMARY

1. A slight increase is anticipated.

2. The present space contains no cooling.

3. A slight increase is anticipated post-war.

4. This proposal will provide complete air conditioning of the Obstetrical Department.

5. Ultimate development calls for housing this service in new quarters.

Prepared by Building Committee of Chicago Colleges.

PROJECT MED. 13e

RELOCATION OF GENERAL STORES

I. DEPARTMENT LOAD

At present, Chicago General Stores occupies seven (7) rooms in various parts of the Medical Center Buildings. The current inventory includes over two thousand (2000) items with an average valuation of approximately forty thousand dollars ($40,000.00). Stock turnover is at the rate of three times annually. The volume of sales and inventory for the past ten years is as follows. The increase in 1942 was occasioned by consolidation of R&E General Stores with Chicago General Stores.

Storeroom and Year	Total Sales for Year	Inventory per Annual Report
Chicago General Stores		
June 30, 1943	$112,492.58	$ 36,964.84
June 30, 1942	95,080.72	37,847.47
June 30, 1941	30,464.43	9,793.96
June 30, 1940	27,099.68	13,074.98
June 30, 1939	24,552.74	9,098.50
June 30, 1938	25,449.68	10,019.63
June 30, 1937	17,076.05	9,781,78
June 30, 1936	16,233.26	7,565.46
June 30, 1935	13,086.34	6,312.76
June 30, 1934	11,271.87	4,864.14
Total for 10 years	$372,807.35	$ 14,532.35
Annual Average	37,280.73	14,532.35

II. PRESENT SPACE

The present space, areas to be retained and areas to be vacated is indicated in detail on the attached Exhibit "A". The inaccessibility and the scattered locations of some of the present areas is not conducive to efficient operation or security of stock.

III. PROPOSED NEW SPACE

Areas surveyed in May, 1942 by Physical Plant and Business Office representatives, resulted in the preparation of blue prints number BP 911-4-66, 67,68,69,and 70. This proposal embraces a space 59' x 56' in an open courtway, south of the Research and Educational Hospital kitchen and east of present Chicago General Stores grocery storage area. This construction when provided would create one undivided area of the dimensions indicated above with a ceiling height under the beams of 10', monitor type roof construction with double hung wood sash windows to provide natural ventilation. Plumbing, heating, drainage and some artificial illumination will be required. This area will be readily accessible to present receiving station and freight elevator. The absence of partitions will lend to flexibility of arrangement of shelving and stock. The area totals 3304 square feet.

IV. FUTURE DEVELOPMENT

New departments, such as the proposed School of Nursing, increased fiscal relationship with affiliated hospitals and institutes, additions to hospitals, increased enrollment, research grants and auxiliary services, will necessitate <u>further</u> expansion. This can be effected when the laundry is relocated by revamping the present laundry area for the Chicago General Stores. This area conveniently adjoins the present grocery stores and comprises a floor area of 2560 square feet. Expansion in this direction at a later date can be effected with a minimum of expense and inconvenience.

V. SUMMARY

Effective stock control and security is difficult to obtain under existing conditions with merchandise carried in seven locations. A 25% increase in efficiency of use of space is a conservative estimate of what may be expected by concentration of stocks of kindred items, better arrangement of shelving and need for fewer traffic aisles. The area proposed is continuous, accessible and would create satisfactory space for this service enterprise through development of space now unusable. The Physical Plant estimates $40,000 will be required to construct and equip this location.

Prepared by Building Committee of Chicago Colleges.

GENERAL STORE ROOM AREAS

ROOM	LOCATION	3 ROOMS TO BE RETAINED	4 ROOMS TO BE VACATED
Grocery Storage	911 Building	728 Sq. Ft.	
Volatile Vault	Underground	518 " "	
Soap Storage	No. 6 - 913 Bldg.	864 " "	
Attic South	5th Floor-911 Bldg.		1880 Sq. Ft.*
Chgo. Gen. Stores	No. 7W- 913 Bldg.		810 " "
Dry Goods Storage	No. 19W - 911 Bldg.		630 " "
Glassware Storage	No. 19 - 909 Bldg.		216 " " *
		2110 Sq. Ft.	3536 Sq. Ft.

* Low ceiling reduces Effective usable Area in these two rooms to approximately $\frac{1}{2}$ actual area

N.B. All other rooms have full height ceilings.

Total Present Area -	5646 Sq. Ft.
Less Area Released	3536 " "
	2110 " "
Add New Proposed Area	3304 " "
Total New Area	5414 " "

PROJECT MED. 13f

RE-HABILITATE SURGICAL SPACE

I. DEPARTMENT LOAD

The operating rooms included in this project perform approximately 1150 major operations and 1700 minor operations each year.

II. PRESENT SPACE

The present surgical space provides six major operating rooms, one minor operating room, and one plaster room, together with numerous adjunct service rooms. The space was originally built in 1923 and has had minor improvements in certain portions since that time. In general, however, it is not planned to meet the specialized requirements of modern surgical techniques.

III. POST-WAR DEVELOPMENT

A slight increase in the load is anticipated for the post-war period.

IV. PROPOSED NEW SPACE

This project proposes a complete modernization of the operating suite including new equipment and air conditioning. The estimated cost is $100,000.00. If the proposed additions to the General Hospital are built, this item need not be considered separately.

V. FUTURE DEVELOPMENT

The only completely satisfactory modernization of operating services will be in providing for them in new quarters.

VI. SUMMARY

1. Approximately 2850 operations are performed each year.

2. The present space needs modernization.

3. A slight increase in load is anticipated post-war.

4. This project proposes complete modernization of the present quarters at an estimated cost of $100,000.00.

5. Ultimate provision for new quarters should be made.

Prepared by Building Committee of Chicago Colleges.

PROJECT MED. 13g

IMPROVE THE ANIMAL HOSPITAL

I. DEPARTMENT LOAD

Extensive investigation of the needs of the Animal Hospital was made in 1939 by a committee appointed for that purpose. Recommendations of this committee, dated December 16, 1939 were approved. The Board of Trustees, February 16, 1940 appropriated $10,100.00 to cover the first phase of this recommended program.

II. PRESENT SPACE

This work has been completed, but the present space still needs further development as covered by the report.

III. POST-WAR DEVELOPMENT

Post-war plans contemplate a slight increase in the work of the Animal Hospital.

IV. PROPOSED NEW SPACE

This project proposes to carry out the remainder of the committee report. In that report, the total estimated cost was established at $65,000.00. Of this, $10,100.00 has been done. Because of the increases in costs and some increases in requirements, we estimate the total cost of completing the project outlined to be $62,000.00.

V. FUTURE DEVELOPMENT

Work done in the Animal Hospital under this project will serve the future development of the University.

VI. SUMMARY

1. Requirements for the Animal Hospital are stated at length in a special committee report.

2. A part of the plan has been carried out.

3. Some increase in this service is anticipated after the war.

4. This project proposes to complete the original plan with slight modification.

5. Work under this project will serve the future development of the University.

Prepared by Building Committee of Chicago Colleges.

PROJECT MED. 13h

REMODEL ADMINISTRATIVE OFFICES

I. DEPARTMENT LOAD

Combination of the Colleges of Dentistry, Medicine, and Pharmacy under an Executive Dean has resulted in marked administrative advantages. Our experience since that combination was made indicates ways in which further advantages can be gained by increasing the coordination of these offices.

II. PRESENT SPACE

The present space in the first floor of the D.M.P. Building was not originally planned for administrative offices and has been adapted to meet other requirements. The physical separation of the various functions which was necessary in this adaption has provided realization of the full benefit of the combination. Other minor services also need and use space on the same floor.

III. POST-WAR DEVELOPMENT

The general plan for post-war development includes a Library, Museum, Auditorium (Visual Education Building) and additions to the General Hospital. If these are carried out, certain space on the first floor of the D.M.P. Building will be freed for other use. Increases in the educational program and in the program for public relations will require some increase in administrative space.

IV. PROPOSED NEW SPACE

This project proposes re-arrangement of the entire first floor

of the D.M.P. Building with the single exception of the extreme south-east corner to accommodate the administrative offices. These include, the Registrar's Office, the Business Office, the Executive Dean's Office, offices of the Deans of Colleges, and other necessary service spaces. The estimated cost of this re-arrangement is $7,500.00.

V. FUTURE DEVELOPMENT

The ultimate plans for the Illinois Medical Center show the administrative offices remaining in their present location. It is not inconceivable that possible expansion of the University within the Medical Center District to include additional academic buildings will eventually call for a separate administration building. Such a building would properly be a part of the over-all expansion plan to be developed when academic expansion is given serious consideration.

VI. SUMMARY

1. The past five years have seen an increase in the service required of the University administrative departments.

2. The present administrative offices provide for all services except the offices of the Physical Plant department.

3. An increase in the load on administrative departments is anticipated in the post-war period.

4. A re-arrangement and increase within the present space is proposed at an estimated cost of $7,500.00.

5. Ultimate development may require a separate building.

Prepared by Building Committee of Chicago Colleges.

PROJECT MED. 131

IMPROVE NURSES' HOME

I. DEPARTMENT LOAD

The University operates a Nurses' Home in connection with the Research and Educational Hospital.

II. PRESENT SPACE

The present Nurses' Home houses 80 graduate nurses and female doctors. Recent improvements have been made in the first floor of this building.

III. POST-WAR DEVELOPMENT

An increase in requirements for these facilities is anticipated after the war.

IV. PROPOSED NEW SPACE

This project proposes improvements in the basement of the Nurses' Home and provision of space on a roof-deck for summertime use. The estimated cost of these improvements is $2,600.00.

V. FUTURE DEVELOPMENT

A new building providing for the housing of 300 nurses is planned for the future.

VI. SUMMARY

1. A Nurses' Home now exists.

2. It houses 80 nurses and female doctors.

3. An increase in this need is anticipated after the war.

4. This project proposes minor improvements in the present building, to cost $2,600.00.

5. A new Nurses' Home is planned for the ultimate development.

Prepared by Building Committee of Chicago Colleges.

PROJECT MED. 13j

HOSPITAL CUBICLES

I. DEPARTMENT LOAD

The General Hospital provides nursing service for all patients in it.

II. PRESENT SPACE

The present General Hospital contains 240 beds, most of which are in wards containing four beds or more.

III. POST-WAR DEVELOPMENT

This project is separate from the proposed hospital additions. In the event those additions are not made the project should be carried out.

IV. PROPOSED NEW SPACE

This project proposes to install metal hanging rods and cloth curtains to enclose all beds in hospital wards. Such enclosure will provide needed privacy and will improve the nursing and teaching service. The estimated cost of this item is $36,000.00.

V. FUTURE DEVELOPMENT

The proposed plans for additions to the General Hospital include provision of necessary cubicles. This project, therefore, will not be necessary if the additions are made.

VI. SUMMARY

1. The General Hospital provides nursing service.

2. The present wards provide no privacy.

3. This project is separate from the hospital additions.

4. Curtained enclosures to give nursing cubicles are proposed, at a cost of $36,000.00.

5. Approval of the hospital additions will make this project unnecessary.

Prepared by Building Committee of Chicago Colleges.

PROJECT MED. 13k

ICE MACHINES

I. DEPARTMENT LOAD

The nursing department is responsible for providing crushed ice for dietary and hospital use. The dietary department is responsible for providing ice cream.

II. PRESENT SPACE

At the present time, ice is received and stored in a refrigerated space, chopped up by hand by the orderlies as required, and delivered to the various floors. The equipment is totally inadequate and requires exceptional care to maintain sanitary conditions. The dietary department at the present time purchases from an outside source all ice cream used.

III. POST-WAR DEVELOPMENT

An increase in the load on all services is anticipated after the war.

IV. PROPOSED NEW SPACE

This project proposes that a machine be purchased which will manufacture flaked ice and store it after dispensing to the floors by the orderlies as required. It also proposes the installation of an ice cream manufacturing machine in or near the main kitchen. The estimated cost of these two installations of $8,500.00.

V. FUTURE DEVELOPMENT

Both of these machines will be useable within the proposed plans for hospital additions.

VI. SUMMARY

1. Quantities of crushed ice and ice cream are now used by the hospital.

2. Providing crushed ice is a hand operation. Ice cream is purchased from an outside source.

3. An increase in load on this service is anticipated post-war.

4. This project proposes the purchase of a machine for manufacturing flaked ice and a machine for manufacturing ice cream.

5. These machines will be useable in the future development.

Prepared by Building Committee of Chicago Colleges.

PROJECT MED. 131

IMPROVE OUT-PATIENT DEPARTMENT VENTILATION

I. DEPARTMENT LOAD

The out-patient department handles approximately 150,000 patient visits per year. This gives an average of approximately 500 per day. Every patient must report to the central control desk at each visit. During the time of patient visits (due to inadequate ventilation) the air in this department becomes malodorous.

II. PRESENT SPACE

The present dispensary space is provided with a minimum of ventilation. Neither the capacity nor the extent of the system gives adequate air movement or adequate supply of fresh air.

III. POST-WAR DEVELOPMENT

The plans for hospital additions provide for adequate ventilation. This project will, therefore, not be necessary if the hospital additions are approved.

IV. PROPOSED NEW SPACE

The project proposes to improve and extend the present ventilating system to give adequate air movement. The estimated cost of this item is $50,000.00.

V. FUTURE DEVELOPMENT

Building the hospital additions at a later date will involve replacement of a portion of the work under this project.

VI. SUMMARY

1. 500 patients per day use the out-patient space.

2. The present ventilating system is inadequate.

3. The proposed hospital additions will provide adequate ventilation. Approval of the hospital additions will make this project.

Prepared by Building Committee of Chicago Colleges.

PROJECT MED. 13m

VENTILATE HOSPITAL WARDS

I. DEPARTMENT LOAD

The hospital has a daily population of approximately 200 patients and an annual total admitted of approximately 6,000.

II. PRESENT SPACE

The present space provides no mechanical ventilation.

III. POST-WAR DEVELOPMENT

Plans for the hospital additions include mechanical ventilation of ward space. Approval of these plans will, therefore, make this project unnecessary.

IV. PROPOSED NEW SPACE

This project proposes to install mechanical ventilation in the present building to give satisfactory air movement in all hospital bedrooms. It will cost an estimated $65,000.00.

V. FUTURE DEVELOPMENT

Building the hospital additions at a later date will involve some replacement of work proposed under this project.

VI. SUMMARY

1. The number of outpatients in the hospital daily is 200.
2. No mechanical ventilation is provided.

3. Proposed hospital additions will provide ventilation. This project will not be necessary if hospital additions are built.

4. This project proposes to install mechanical ventilation for the present hospital bedrooms at an estimated cost of $65,000.00.

5. Building hospital additions at a later date will involve some replacement of this work.

Prepared by Building Committee of Chicago Colleges.

PROJECT MED. 13n

TERRA COTTA WAINSCOTING IN GENERAL HOSPITAL

I. DEPARTMENT LOAD

The present General Hospital is quite generally used by the public as well as by students and medical staff.

II. PRESENT SPACE

A 5' 6" high wainscoting of dark brown glazed brick was originally provided in all corridors and many hospital spaces. The character and quality of this material are such that they create an atmosphere of gloom and present a surface which is difficult to keep clean.

III. POST-WAR DEVELOPMENT

The proposed hospital additions contemplate replacement of much of this material in the General Hospital. Approval of those additions will make only a portion of this project necessary.

IV. PROPOSED NEW SPACE

This project proposes to remove the present glazed brick wainscoting and replace with new terra cotta as has already been done in the first floor of the General Hospital. The total estimated cost is $80,000.00. If the hospital additions are approved, only $5,000.00 of this total will be needed to provide new terra cotta wainscoting in the corridors of the central unit, D.M.P. Building.

V. FUTURE DEVELOPMENT

If the hospital additions are built at a later date, some replacement of the material proposed under this project will be necessary.

VI. SUMMARY

1. The hospital is used by the public.

2. The present wainscoting material is unsatisfactory.

3. The proposed hospital additions will replace this material.

4. This project proposes replacing the material with new terra cotta.

5. Building the hospital additions at a later date will involve removal of some of the work under this project.

Prepared by Building Committee of Chicago Colleges.

PROJECT MED. 130

ENCLOSE PORCHES ON SECOND & THIRD FLOORS OF GENERAL HOSPITAL

I. DEPARTMENT LOAD

Teaching and service demands are made on the hospital in excess of the service which can be rendered.

II. PRESENT SPACE

The present hospital accommodations (240 beds) are loaded to capacity.

III. POST-WAR DEVELOPMENT

It is planned to increase the number of hospital beds by the building of a hospital addition. The work proposed under this project is to be included in the hospital additions and will, therefore, not be needed as a separate item if these additions are approved.

IV. PROPOSED NEW SPACE

It is proposed to enclose two recessed porches, each approximately 16' square, on the second and third floors of the General Hospital, west section. This will provide space for four additional beds, at an estimated cost of $3,000.00.

V. FUTURE DEVELOPMENT

If the hospital additions are built at a later date, the work proposed under this project will not have to be replaced.

VI. SUMMARY

1. Excessive demands for service are made upon the General Hospital.

2. The hospital is now loaded to capacity.

3. Post-war plans call for the addition of hospital beds.

4. This project proposes to enclose porch space to provide four hospital beds, at an estimated cost of $3,000.00.

5. Building the hospital additions in the future will not effect this work.

Prepared by Building Committee of Chicago Colleges.

PROJECT MED. 13p

ACOUSTICAL TREATMENT IN GENERAL HOSPITAL

I. DEPARTMENT LOAD

The demands upon the General Hospital are in excess of its ability to give service.

II. PRESENT SPACE

The present General Hospital is filled to capacity. Acoustical correction has been provided on the ceilings of many corridors and some bedroom spaces.

III. POST-WAR DEVELOPMENT

Plans for the hospital additions include acoustical correction.

IV. PROPOSED NEW SPACE

This project proposes to extend the installation of acoustical treatment to numerous other spaces where it is needed. It will cost an estimated $10,000.00. If the hospital additions are approved, this work will not be needed as a separate item.

V. FUTURE DEVELOPMENT

Building the hospital additions at a later date will involve replacement of some of the material proposed under this project.

VI. SUMMARY

1. Excessive demands are made on the hospital.
2. The hospital is filled to capacity. Some acoustical correc-

tion has been provided.

3. Plans for post-war additions include acoustical correction.

4. This project proposes additional acoustical correction at an estimated cost of $10,000.00.

5. Later developments may require removal of some of this material.

Prepared by Building Committee of Chicago Colleges.

PROJECT MED. 13q

CO-ORDINATE LABORATORY & OFFICE SPACE

I. DEPARTMENT LOAD

The University Colleges of Dentistry, Medicine, & Pharmacy have a staff of approximately 800.

II. PRESENT SPACE

The present D.M.P. Building includes approximately 150 combined laboratory and offices, as well as numerous general laboratories and other separate office spaces.

III. POST-WAR DEVELOPMENT

Plans for the post-war period include a more intensive use of the academic building and removal from this building of as many of the exclusively service functions as possible. Some increase in the number of staff members is anticipated.

IV. PROPOSED NEW SPACE

This project proposes to make a detailed study of the use of such spaces to determine whether such use can be made more efficient by separating some of the combination laboratory and office spaces. It is also directed towards improving the general quality of laboratory work by centralizing it. The estimated cost of the survey and anticipated changes is $86,000.00. The estimated cost of the survey and preparation of drawings for the changes is $6,000.00.

V. FUTURE DEVELOPMENT

Ultimate plans for the development of the Illinois Medical Center will benefit from the work proposed in this project.

VI. SUMMARY

1. The present University staff is approximately 800.

2. The present office space provided for them does not fully serve their needs.

3. Post-war plans call for more intensive use of the D.M.P. Building.

4. This project proposes a re-study of the office space for more efficient use.

5. This project will contribute to the plans for future development.

Prepared by Building Committee of Chicago Colleges.

PROJECT MED. 13r

ENLARGE DENTAL LABORATORIES

I. DEPARTMENT LOAD

The teaching requirements of the space in question call for laboratory accommodations for two units of approximately 100 students each.

II. PRESENT SPACE

The present technical laboratories, rooms No. 771 and No. 668, accommodate a maximum of 50 students. This means that in neither of the laboratories can a full class be conducted. Considerable improvement in teaching can be accomplished by having these classes in single units instead of divided as is now necessary.

III. POST-WAR DEVELOPMENT

It is anticipated that the post-war period will see some increase in the requirements for laboratory teaching.

IV. PROPOSED NEW SPACE

This project proposes to enlarge the two technical laboratories referred to within the present space and the installation of sufficient additional equipment to accommodate 100 students in each laboratory. The estimated cost of this operation is $50,000.00. This improvement will free two smaller laboratories for other teaching use.

V. FUTURE DEVELOPMENT

The improvement proposed will benefit the plans for future development.

VI. SUMMARY

1. The department needs laboratory teaching units to accommodate 100 students.

2. The present laboratories accommodate 50 students.

3. Some increase in student enrollment is anticipated after the war.

4. Increase in size of two technical laboratories to accommodate 100 students each is proposed at an estimated cost of $50,000.00.

5. This change will benefit future plans.

Prepared by Building Committee of Chicago Colleges.

PROJECT MED. 13s

CORRIDOR EXHIBIT CASES

I. DEPARTMENT LOAD

The student body and staff would be well served by having much more visual material accessible to them.

II. PRESENT SPACE

The present display material is limited to a few corridor display cases and two museums. (See fuller comment under Visual Education Building).

III. POST-WAR DEVELOPMENT

The post-war plans include a Library, Museum, Auditorium, (Visual Education Building) and anticipate a major increase in the use of visual material.

IV. PROPOSED NEW SPACE

This project proposes to provide display space for such material both as an experiment to determine the extent to which such plans can be carried and as an aid to the broad plan for display of visual material contemplated in the Visual Education Building project. It is proposed that 40 or 50 glass front display cases, costing an estimated $10,000.00, be installed at important points along the existing corridors and that material now available and new material to be acquired be displayed in them.

V. FUTURE DEVELOPMENT

This project will aid in the future plans for a Visual Education Building.

VI. SUMMARY

1. More visual material can well be used in the teaching program.

2. The present display space is inadequate.

3. Post-war plans call for extensive development of visual teaching material.

4. This project proposes the installation of display cases, costing an estimated $10,000.00.

5. The project will aid future development of visual material.

Prepared by Building Committee of Chicago Colleges.

PROJECT MED. 13t

PHARMACOGNOSY GREENHOUSE

I. DEPARTMENT LOAD

The Pharmacognosy Department at present conducts experiments on drug materials leading toward the development and improvement of domestic sources for drugs. Transportation difficulties encountered in war-time have stimulated research activity along these lines.

II. PRESENT SPACE

The department now uses experimental materials secured from outside sources, most of which are not under the University's control. No provision exists at present for controlled growing of drug plants within the University.

III. POST-WAR DEVELOPMENT

Continuation and expansion of the research program is anticipated in the post-war period.

IV. PROPOSED NEW SPACE

This project proposes to enclose an existing roof deck with a greenhouse structure and equip the space with trays, heating, lighting and other necessary accommodations to permit the growth of selected plants as part of the Pharacognosy Laboratory research work. The estimated cost of the proposed installation is $10,000.00.

V. FUTURE DEVELOPMENT

The work proposed under this project will contribute to later University development.

VI. SUMMARY

1. The Department of Pharmacognosy is studying domestic growth of drug plants.

2. There is at present no space for growing plants within the University.

3. Continuation of this study is anticipated after the war.

4. This project proposes a greenhouse on an existing roof deck. The estimated cost is $10,000.00.

5. The project will contribute to future University development.

Prepared by Building Committee of Chicago Colleges.

SECTION 3

PROJECTS PROPOSED BY

THE COLLEGE OF LIBERAL ARTS AND SCIENCES

SECTION 3

PROJECTS PROPOSED BY

THE COLLEGE OF LIBERAL ARTS AND SCIENCES

GENERAL COMMENTS

The Building Committee of the College of Arts and Sciences supports the proposal from the Department of Chemistry for the construction of a new Chemical Laboratory on the block east of the Old Agriculture Building and for vacating entirely the present Chemistry Building, this proposal to include provision, first of all, for the needs of Chemical Engineering.

It seems to us that the University as a whole will soon be faced with two pressing demands; first, a demand for modern laboratory construction and equipment for advanced undergraduate instruction and for graduate and research work; and second, a demand for a considerable increase in class room space.

The only significant modern laboratory unit on the campus is the Talbot Laboratory which accommodates a relatively small number of students. Though many divisions of the University are in the same situation as Chemistry, we feel that the arguments advanced in the proposal from the Chemistry Department justify the claim that they should have immediate and substantial relief.

Whatever the statistics on class-room space may show, it is a fact that in the summer and fall with certainly not more than ten thousand students on the campus class rooms at various hours were almost unobtainable. We have in the past accommodated larger numbers under conditions which could in some measure be controlled. Such conditions are not likely to recur for a number of years. There has been also a steady drain on class-room space to provide offices.

The proposal to move the entire department of Chemistry into new quarters would release a large amount of conveniently located space for class room purposes. It would also permit of immediate relief for Bacteriology and would provide quarters for the expanding work in Geography and in Social Science.

Our Committee is convinced of the importance of keeping all the basic work in science and the humanities in close proximity to the central quadrangle. Naturally, more special types of work could be accommodated in less accessible, and perhaps more suitable, parts of the campus.

Prepared by College Committee on Buildings:

John C. Bailar
Neil E. Stevens
Arthur B. Coble, Chairman
M. T. McClure, Executive Officer

SUMMARY OF PROJECTS

PROPOSED BY

COLLEGE OF LIBERAL ARTS AND SCIENCES

Number		Gross Floor Area	Page
L.A.S. 1	Chemical Laboratory	200,000 sq.ft.	4
L.A.S. 2	Chemical Engineering Building . .	50,000 " "	15
L.A.S. 3	Bacteriology Laboratory	------ (a)	23
L.A.S. 4	Additional Classrooms and Offices	------ (a)	26
L.A.S. 5	Biology Buildings	70,000 " "	29

(a) Included in Project P.P. 3

CHEMICAL LABORATORY

I. INTRODUCTION

The Chemistry Department of the University has been badly crowded and inadequately housed for many years. This memorandum points out the deficiencies in the present plant, and makes a definite proposal for new quarters. These new quarters are needed now, and every effort should be bent toward obtaining them as soon as the war is ended.

II. DEPARTMENT LOAD

The Chemistry Department has shown a continuous and rapid growth in enrollment for many years, as is shown by the data in the enclosed table. Crowding became intolerable in 1938 and it was necessary to limit the enrollment in chemistry and chemical engineering by raising the requirements for admission to both graduate and undergraduate courses. The Chemistry Department is the only department in the University which has found it necessary to turn students away because of lack of space. This limitation afforded temporary relief, but by 1940 the enrollment was again approaching an all time high. The decreases since that time have been the direct result of the war. There is every reason to believe that growth will continue at an accelerated rate after the war. The attitude of the Selective Service System toward chemists and chemical engineers has been widely publicized and has focused the attention of the American people on the importance of these professions. Vast chemical plants have been built for the manufacture of synthetic rubber, aviation gasoline, magnesium, chlorine, explosives, and other chemicals. Some of these factors will doubtless be abandoned when the war is ended, but most of the chemical companies are laying plans for the utilization of their plants in peace-time work. The War Manpower Commission

has recently estimated that there is shortage of 10,000 chemists in the United States. The problem, however, is more than one of numbers of students. The chemical industry has not only greatly increased in size in the last twenty years, but also has completely changed in character. A quarter of a century ago, most professional chemists in America were analysts in such plants as steel mills, smelters, and railroad laboratories. Only a few simple chemicals which were used in bulk quantities, such as soda ash, lye, and sulfuric and hydrochloric acids, were manufactured in America. Now, however, the great majority of American chemists are engaged in the development or manufacture of synthetic chemicals, textiles, plastics, fertilizers, vitamins, and a host of other products. This change in the character of the industry has greatly multiplied the problems of chemical education. An analyst may be trained with simple equipment occupying only a small amount of space. To train a man to develop new processes, discover new products, or to do any other type of research is an entirely different matter. He must have access to many types of equipment and, in some cases, to rooms where the temperature and humidity can be controlled. To teach the processes of commercial production, we must provide our students with large scale equipment. The laboratories built twenty-five years ago were adequate for their intended purposes but they are totally unfitted for the type of instructional work which must now be done.

It should be pointed out also that the Chemistry Department gives instruction to many students who are preparing for careers in other fields. All students in the college of engineering take at least two courses in chemistry, and those in agriculture take at least three courses. Students in the pre-medical and pre-dental curricula, and those majoring in physics, geology, mathematics, bacteriology and other sciences constitute a large

part of the enrollment in freshman and sophomore chemistry courses. The rapid growth which the sciences are showing will put an added burden on the Chemistry Department.

A study made about 1937 clearly showed the need for more space for our research students. Several universities comparable to the University of Illinois were asked to give us data from which we could calculate the number of square feet of laboratory space available for each research student. The average at all of the schools which replied was 310 sq. ft. per student. The comparable figure at Illinois was 169 sq. ft. It is significant that none of the other schools felt that they had more space than they needed, and several felt that they were badly overcrowded.

III. PRESENT SPACE

The present quarters provided for chemistry and chemical engineering were built in three units. The first unit, which constitutes the West Half of the Noyes Laboratory, was built in 1902. It has a total floor area of 71,464 square feet. It was well built, and is in good condition from the structural point of view, but from the chemical point of view, it suffers from two major defects -- it is not fireproof, and it is inadequately ventilated.

Unusual fire hazards are inherent in chemical work. When hundreds of students are housed in an inflammable structure the dangers to life become a serious responsibility. The University is extremely fortunate in that a catastrophy in the Chemistry Building has so far been averted. A fire of serious proportions would cause explosions, which would increase the danger to students and others who attempted to control the conflagration.

In addition to the danger to life, destruction of the chemistry building would occasion an enormous loss in equipment and supplies. The attached table (Table II) gives a conservative estimate of the monetary value of these items. The University carries insurance on the building and its contents, in contrast to its practice with respect to most other campus structures. But many of the items included in Table II could be replaced only by years of effort. Many pieces of equipment have been designed and built for special purposes. An extensive collection of rare chemicals has been accumulated through the efforts of many individuals. Such items cannot be valued in terms of dollars and cents. Their destruction would be a calamity. Not the least important would be the loss of the scientific records, directions for chemical processes, and research data in the files of the staff members. Such materials could not be replaced at any price; nor can it be kept in vaults, for it is being consulted constantly by both students and staff. Indeed, this accumulation of experience, as represented by the records of the staff, contributes enormously to the teaching and research success of the Department. The fire hazard alone is sufficient to justify the erection of a new building.

The second unit of the present plant constitutes the east half of Noyes Laboratory and has a floor area of 80,141 sq. ft. It was erected in 1916, and is of fireproof construction. However, a fire in the older part of the building would probably render this unit almost entirely useless for a considerable period of time. The ventilation in the east part of the building is no better than that in the older unit, and is notoriously inadequate. Fumes of all sorts, which in a well planned laboratory would be carried to the exterior by hood flues, constantly escape into the laboratories.

Many of the hoods, including some of those located in the newer east part of the building, have never had flue connections. Those that have, fail to function. Indeed, the only operative fume carriers are the stair-wells. These serve to distribute the fumes throughout the building. This lack of ventilation is a serious menace to the health of the students and staff. The cost of improving this situation in the present structure would be large.

Closely related to the lack of ventilation are the conditions which exist on the fourth floor where the laboratories of biochemistry are located. Most of these rooms, including the class and research laboratories and the offices, are illuminated by sky-lights. During the summer months the temperatures are all but insufferable. The windows are small and permit very little circulation of air. As a result of the combined effects of the sun, gas burners, and steam stills, it is a common experience for the students to work in temperatures in excess of 100°. Several of the individual research laboratories have no windows whatever. Unless one visits the fourth floor during the summer months, he cannot possibly appreciate fully the need for new quarters.

During the twenty-seven years which have elapsed since the newer part of the Chemistry Building was erected, a number of other facilities have become essential for research. Among these may be mentioned cold rooms, constant temperature rooms, air-conditioned rooms for experimental animals, and rooms for expensive items of equipment. At the present time not one of the above, all of which are found in modern laboratories, is available. Such rooms are not to be regarded as unessential luxuries. On the contrary, they are indispensable for many types of chemical work. To install them in the present building would be very costly, even if space were available; but they would add greatly to the expense of a new structure.

The third and most recent unit of the present plant is the Chemistry Annex, which was occupied in 1931. It is fireproof, reasonably well ventilated, and has a floor area of 36,768 sq. ft. It was designed for use in teaching elementary chemistry, and is quite satisfactory for that purpose. It has capacity for a reasonable expension in enrollment. At present, the top floor is used for instruction in qualitative and quantitative analysis.

The Chemistry Annex will be retained by the Chemistry Department in any plans for the future. The entire Noyes Laboratory, however, should be converted to other uses. The cost of ventilating, fireproofing, and refitting it for modern chemical work would be large.

IV. POST-WAR DEVELOPMENT

The growth of the chemical industry during recent years has shown no sign of abating; on the contrary, it seems to be accelerating. Following cessation of hostilities some provision must be made for departmental expansion unless the University is prepared to limit further the enrollment in courses. In the opinion of the Department, the latter alternative would be an unfortunate solution of the question of space. In this connection it should be emphasized that the Department has never experienced difficulty in placing its graduates. The demand for those who attain the degree of Doctor of Philosophy always exceeds the supply.

Problems arising from the war have led to the development of many new fields of activity in chemistry. Students of the future will require training in these new areas of knowledge, and the Department cannot hope to retain its present position of eminence unless facilities for such instruction are made available. Among these new developments may be mentioned the chemistry of plastics, including synthetic rubber, synthetic fibers,

surface coating materials, and molding plastics. Some idea of the tremendous activity in this field may be obtained from the fact that the rubber industry alone will be more than one hundred times as large as the total pre-war plastic industry. Other problems of equal importance are the newer developments in aviation gasoline, aviation lubricating oils and brake fluids, synthetic drugs, and synthetic insecticides. Several new applications for organo-fluorine compounds have come to light. Certain of these products are resistant to high temperatures, and bid fair to become of importance second only to synthetic rubber. Obviously, the chemistry department of the post-war era must be in position to offer courses in and to furnish facilities for research along these and other modern lines.

V. PROPOSED NEW SPACE

It is proposed that new quarters for chemistry and chemical engineering be constructed on the block directly east of the Chemistry Annex and bounded by Mathews, California, Goodwin and Oregon Streets. This structure should have a floor area of at least 250,000 sq. ft., which is approximately 110,000 sq. ft. more than that now provided in Noyes Laboratory. About 16,000 sq. ft. in Noyes Laboratory is not used by the Chemistry Department, but by the Department of Bacteriology and the State Water Survey. This will give space for new facilities as well as for an increase in student enrollment.

One unit of this structure with approximately 50,000 sq. ft. of floor area would be designed for work in chemical engineering with large laboratories and pilot plant on the first floor, balconies to provide for tall construction, overhead cranes, adequate sewers to handle large

quantities of water and waste, and adequate power, gas, steam, vacuum, compressed air, and water lines. A machine shop should be provided. (See Project L.A.S. 2)

The units assigned to chemistry should contain cold rooms, animal rooms, rooms in which temperature and humidity can be controlled or at least kept constant, dark rooms for photographic work, vaults for the storage of rare chemicals, and rooms where valuable and delicate instruments may be used and stored. The laboratories would need water, distilled water, gas vacuum, compressed air and electric lines. In certain parts of the building both direct and alternating current should be supplied. Well ventilated hoods and adequate general ventilation are major needs.

VI. FUTURE DEVELOPMENT

A building such as that described above should be adequate for many years to come. Research interests and methods of instruction change with passing years, however, so every effort should be made to design a building which is as flexible as possible.

VII. SUMMARY

The number of students in chemistry and chemical engineering has increased rapidly and steadily for many years. In spite of the fact that many well qualified students have been turned away from work in chemistry and chemical engineering, the department is greatly overcrowded. Still further restrictions on enrollment will have to be made after the war unless new space is provided.

As the American chemical industry has developed, educational needs have changed greatly, and the Noyes Laboratory is not suited to modern chemical work. It is proposed, therefore, that this building be remodelled for classroom use, and that new quarters be provided for chemistry and chemical engineering. Such quarters must be adjacent to the Chemistry Annex, and must be provided with facilities for up to date work in chemistry and chemical engineering. A floor area of 250,000 sq. ft. is proposed, 50,000 sq. ft. of which would be occupied by Chemical Engineering. (See Project L.A.S. 2) Such a building would probably cost about two and a half million dollars.

Prepared by College Committee on Buildings.

Table I.

Enrollment in Chemistry Courses, 1928-1943

Semester	Year	Freshmen	Total	Total per year
I	1928-29	1587	2942	
II	1928-29	1265	2666	5,608
I	1929-30	1635	3046	
II	1929-30	1374	2282	5,328
I	1930-31	1656	3216	
II	1930-31	1368	3025	6,241
I	1931-32	1941	3378	
II	1931-32	1221	3101	6,479
I	1932-33	1266	3162	
II	1932-33	970	2731	5,893
I	1933-34	1123	2850	
II	1933-34	1083	2606	5,456
I	1934-35	1358	3230	
II	1934-35	1159	2940	6,170
I	1935-36	1208	3627	
II	1935-36	1358	3377	7,004
I	1936-37	1833	4089	
II	1936-37	1561	3866	7,955
I	1937-38	1880	4507	
II	1937-38	1582	4013	8,520
I	1938-39	1760	4459	
II	1938-39	1456	3939	8,398
I	1939-40	1607	4039	
II	1939-40	1160	3603	7,642
I	1940-41	1767	4621	
II	1940-41	1436	3729	8,350
I	1941-42	1708	4070	
II	1941-42	1121	3361	7,421
I	1942-43	1938	4091	
II	1942-43	1180	2989	7,080

(These figures include no summer session students and have been corrected for withdrawals.)

Table II.

Estimated Value of Equipment and Supplies in the Chemistry Building

Movable permanent equipment	$ 295,000[1]
Books in Chemistry Library (at $3.00 per vol.).	52,500
Inventory, General Chemical Stores	41,000[2]
Apparatus in student desks (for class purposes).	19,300[3]
Apparatus in desks of research students	3,370[4]
Supplies and chemicals in Department store rooms.	52,000[5]
Special chemicals	40,000
Total exclusive of State Water Survey and Department of Bacteriology	$503,170

1 This estimate was furnished by Mr. C. P. Slater, Assistant Purchasing Agent.
2 Estimate of M. W. L. Bennett, based on inventory of June, 1942.
3 Actual cost value.
4 Based on average cost of apparatus used during previous years by 1000 research students after allowing for breakage.
5 This value is conservative, and may be low.

Table 1.

Enrollment in Chemical Engineering at the University of Illinois
(Official Registrar's Figures)

Year	1st Semester	2nd Semester	B.S. Degrees Conferred in Chemical Engineering
1926-27	118	104	13
1927-28	116	105	14
1928-29	132	108	16
1929-30	148	120	20
1930-31	197	170	11
1931-32	236	205	25
1932-33	205	175	45
1933-34	175	164	34
1934-35	210	191	35
1935-36	250	229	30
1936-37	328	280	50
1937-38	311	230	39
*1938-39	284	224	39
1939-40	287	229	44
1940-41	310	267	52
1941-42	332	294	58
1942-43	341	254	51

* Scholastic restrictions instituted.

TABLE 1.

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

* [illegible] [illegible].

PROJECT L.A.S. 2

CHEMICAL ENGINEERING BUILDING

I. INTRODUCTION

The necessity for improving the facilities for the teaching of Chemical Engineering at the University of Illinois has been evident for the last ten years. The space now available is inadequate in size and unsuitable for the type of instruction and research considered necessary in this field. At present, all of the classroom work and a part of the laboratory instruction in Chemical Engineering is carried on in the Noyes Chemical Laboratory. The remainder of the laboratory work, including most of the undergraduate and graduate research, has been carried on in two temporary buildings, located several blocks from the Noyes Laboratory, and in a room at the Abbott Power Plant. Not only is this arrangement unsatisfactory from the standpoint of efficient use of the students' and faculty's time, but even these places are overcrowded and will no longer take care of the enrollment in the curriculum. A new building is requested which will adequately house all of the instruction in Chemical Engineering and which will permit the installation of new equipment and pilot plant facilities so essential for work in this field.

II. DEPARTMENT LOAD

The growth of enrollment in the undergraduate Chemical Engineering curriculum since 1926 is shown in Table 1. Prior to that time only a few courses were given in this subject, and most of these were confined to Industrial Chemistry. Modern Chemical Engineering may be said to have started about the time of the last war. It has developed rapidly during the last two decades with the growth of the petroleum and process industries. Since the beginning of the new curriculum the

enrollment has almost trebled and the University now ranks among the largest schools in the country in this respect. In 1938, the facilities were already so overtaxed that it was necessary to reduce the enrollment by increasing the scholastic requirements for the upper classes. While this measure provided temporary relief, the number of students again began to increase by 1940, and in the Fall of 1942 it had reached an all-time high. Continuation of this growth after the war is expected because of the increasing importance of the synthetic chemical process industries and the widespread opinion that the basic training given in Chemical Engineering is broadly applicable to other engineering professions.

This growth is not peculiar to Chemical Engineering at the University of Illinois. It has been experienced by nearly all of the Chemical Engineering departments in this country. In a survey of sixty-nine schools covering the five years prior to 1941, it was found that nineteen had completed new buildings, or had new buildings under construction. Thirty-eight others had made extensive additions to the Chemical Engineering laboratory or had remodeled an existing building to provide a laboratory. Only seven schools indicated that they had not made alterations, and three of these had active plans either for new buildings or for extensive remodeling of existing ones. At the present time the space available per student at Illinois is less than that at thirty-six of the forty-eight accredited schools in the United States; and the schools which rank lower than Illinois in this respect are, for the most part, those which have large evening classes composed of part time students.

In the present undergraduate curriculum at the University, the courses in Chemical Engineering are given in the junior and senior years.

These consist of classroom instruction, involving problems and design calculations, and laboratory work with model or pilot plant equipment. For the former, the classes must be small enough so that individual attention can be given to each student, and, for the latter, sections of twelve to fifteen composed of squads of three men are preferable. This means that a large number of pieces of equipment must be in operation at the same time, and much floor space is needed for work desks and control apparatus.

The number of graduate students majoring in Chemical Engineering at the University of Illinois has never been large, due in part to the lack of adequate facilities for research in this field. The maximum number was reached in 1938, when eighteen students were present. The growth of the graduate work in this subject should be encouraged by the University, especially in courses and research leading to the Master of Science Degree in Chemical Engineering. Before the war, several accredited schools adopted the five-year curriculum for Chemical Engineering, and many industries advocated that their prospective employees have a Master's Degree. This policy has been endorsed by the American Institute of Chemical Engineering, the principal accrediting body for the profession.

The University has always held an outstanding position in research in Chemical Engineering. Many important investigations have been carried on in this field as a part of the activities of the Engineering Experiment Station. A large portion of this work has been supported by industries in the state which have contributed over $350,000 for fundamental work on such problems as the prevention of embrittlement in steam boilers, water treatment for high-pressure boilers, the treatment of stack gases from high sulfur Illinois coals, ice manufacture, electrochemical manufactures, and high-pressure

reactions and processes. The recognition of the prominence of the University in this field is evidenced by the large contracts amounting to more than $250,000 a year, maintained by the National Defense Research Committee for research connected with the war effort. Much of the work on these cooperative investigations has been carried on in temporary quarters built from funds supplied by the sponsors.

In 1926, the staff in Chemical Engineering consisted of six full-time and approximately six part-time men. Due to the increase in cooperative research work, the number of full-time staff approximately doubled in the next five years. Just before the war there were eight full-time men, four of whom devoted their efforts almost exclusively to research, and about twelve part-time men as teaching and research assistants. At the present time the large war research project in this Division employs more than twenty-five engineers and chemists.

III. PRESENT SPACE

Most of the instruction in Chemical Engineering is given in the East Wing of Noyes Laboratory, constructed in 1916, where 14,500 sq. ft. is available. A part of the undergraduate laboratory work is given in the basement of the building. The main unit operations laboratory, where practical training is given in distillation, evaporation and settling, and a small student machine shop are located in the basement of the old part of Noyes Laboratory. The restrictions presented by the fire hazard in this location are severe. Just as serious are the lack of head room, inadequate floor space, and poor lighting. Many laboratory experiments have had to be omitted entirely because necessary equipment could not be installed. Indeed, no new large-scale equipment for undergraduate instruction has been purchased since

1926, and much of the present equipment was originally obtained second-hand after the last war. At the present time there is not room in the laboratory to handle the large sections which are required, and many of the students do not get first-hand experience in the operation of the equipment.

As indicated above, most of the cooperative research work, even before the war, was housed in specially built temporary structures. Two of those are now in use, and a third has been dismantled. In one of these present structures, over $30,000 of equipment for studying reactions at extreme high pressures has been assembled. The building is of frame construction and the danger of fire persists because of the nature of the work. Another research laboratory was provided at the Abbott Power Plant, were balconies and head room were available for tall construction. In all of these temporary facilities, undergraduate and graduate research has been carried on for years. At the peak of the enrollment in 1942, fifteen men were engaged in thesis work in two small rooms in one of these shacks. The combined area of these temporary quarters is approximately 3000 sq. ft.

IV. POST WAR DEVELOPMENT

The indications are that the past trend of enrollment will be continued after the war. The tremendous development in synthetic rubber, aviation gasoline, plastics, heavy chemicals, food processing, new metals, and textiles will place a heavy demand on the colleges and universities to turn out more chemical engineers. Thousands of young men have had their college work interrupted by the call to military service. Many of these will return to enter the field of this relatively new profession. Even before the war the number of students in Chemical Engineering in colleges in the United States was among the largest of all branches of engineering. Several of the

3. Small overhead crane for moving heavy equipment.

4. Adequate sewers for handling large quantities of water and wastes.

5. Accessibility of piping and electrical circuits.

6. Proper lighting of laboratories and shops.

7. Heavy floor construction throughout laboratory area to carry storage tanks.

8. Adequate electric power lines.

9. Proper ventilation of all laboratories and air conditioning of lecture rooms.

10. Delivery entrances and freight elevators conveniently located.

In planning the location of the building, consideration must be given to the close relationship between Chemical Engineering and other branches of Engineering as well as Chemistry. A large percentage of the basic courses required for proper training involved are Physics, Mathematics, Theoretical Mechanics, and Electrical and Mechanical Engineering. It is a fact that the trend in Chemical Engineering education in the United States is toward the engineering side. This has the support of the industry which employs the graduates as well as the American Institute of Chemical Engineers. Nevertheless, the convenience of an excellent library in Chemistry and the opportunity to associate closely with students and faculty in related fields of scientific research is especially valuable to the faculty and graduate students in Chemical Engineering.

VI. FUTURE DEVELOPMENT

While it is expected that the growth of Chemical Engineering will be accelerated by the war, there is no reason to believe that the profession will become oversupplied with men. During the last depression, there was always a demand for well-trained students in this field. This will continue

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for many years, but with the growth of the departments throughout the country, excessively large development at any one school should not be expected.

VII. SUMMARY

The present space and facilities for teaching Chemical Engineering at the University of Illinois are no longer suitable or adequate for proper instruction. The enrollment in this curriculum has nearly trebled in the last fifteen years but no permanent space has been provided for the installation of new large-scale laboratory equipment since 1919. The laboratory and research work is divided between the poorly ventilated basement of Noyes Laboratory, where there is no head room for tall equipment, two temporary frame buildings housing large amounts of expensive equipment, and a room at the Abbott Power Plant, all of which are already overcrowded.

A continuation of the growth of the enrollment may be expected after the war. If proper facilities are provided probably 600 undergraduate students may be expected within five years. With support for the purchase of necessary equipment and enlargement of the staff, the number of graduate students should reach one hundred within ten years. A building to house the instruction of such a number of students should have about 50,000 sq. ft. of working space and be designed to accommodate large equipment for laboratory and pilot plant.

Prepared by College Committee on Buildings

PROJECT L.A.S. 3

BACTERIOLOGY LABORATORY

I. DEPARTMENT LOAD

In terms of enrollment our highest just before the war was 1500 per annum. Of these 75 were undergraduate majors and 25 graduate majors. The latter were, of course, working for advanced degrees and required laboratory space for thesis work.

II. PRESENT SPACE

We are located in the Noyes Laboratory of Chemistry with 6679 sq. ft. of office and laboratory space and about 150 sq. ft. of animal room space. The latter is in the attic and is totally inadequate for our work.

III. POST-WAR DEVELOPMENT

Before the war our work was increasing regularly each semester in both the graduate and under-graduate levels. After the war we anticipate greater interest in bacteriology because of its relation to medicine and industrial work. We expect to pick-up about where we left off and also secure the normal increase in enrollments.

IV. PROPOSED NEW SPACE

Former estimates which are still sound as far as we can determine now, were that some 15,000 sq. ft. of space would be needed for ordinary expansion of instructional work. This was provided for us on the first floor of the Old Agricultural Building and funds were appropriated for modernizing and fire-proofing it. It may be assumed that the Physical Plant Department had arranged for the work now located there. In our present quarters one laboratory has had to be taken over for an addition to our preparation room.

V. FUTURE DEVELOPMENT

This has been partly answered in the above paragraphs. More space is needed for regular instructional and research work as well as for special work which may be brought to the university under grants-in-aid if there are qualified individuals to attract it.

VI. SUMMARY

The above statements are in reality summary statements. Much work has already been done on plans for adapting the First Floor of the Old Agricultural Building to our work. This is quite adequate and has the special advantages of being close to the work in soil bacteriology and dairy bacteriology in which laboratories many of our students study.

We have analyzed our relationship to these other branches of bacteriology and to the other branches of biology. We believe that we have too little in common with the latter to be placed with them in one large building. While bacteriology is a branch of biology when gross considerations are weighed, it has grown away from the general field because of its special technics and methods. In practically all universities, it is organized as a special unit.

I personally fail to see the urgency of a separate biology building at the present time when other buildings are more badly needed. Several of the biology departments are quite well housed with respect to floor space and conveniences and are not asking for more space. Of course, the arrangement might not be quite as satisfactory as they would like it but good work may still be done for quite a few years.

The following does summarize our ideas:

1. We wish to be where the students are - near the middle of the campus.

2. Space was given us in the Old Agricultural Building and money was appropriated to modernize and equip it.

3. With animals inoculated with pathogenic bacteria, a hazard exists for animals of other departments.

Prepared by: F. W. Tanner
Head of Department

PROJECT L.A.S. 4

ADDITIONAL CLASSROOMS AND OFFICES

Pre-war enrollments have demonstrated the need for additional classroom space to provide for the expected increase in the number of students. Any increase in student enrollment will call for a corresponding increase in staff which, in turn, will require more office space.

The required classroom and office space can be provided in a new building constructed for that purpose or it can be made available by remodeling and reconditioning space which may be vacated because of the construction of other buildings.

At the present time, the need for modernizing many of the older laboratories is acute. Some of these were built fifty years ago, many are over forty years old and few have been constructed during the past twenty years.

Because of the special requirements of laboratories, it is cheaper and much more satisfactory to construct new laboratory space than to modernize old laboratories and construct new classroom and office space.

The new classroom and office space should be located in the central part of the campus so that students can go from class to class during the ten-minute intermission period.

If new space is provided for Chemistry and Chemical Engineering, at least the west section of Noyes Laboratories will be released for other uses. This section was completed in 1902. It is of heavy-timber construction with brick bearing walls. The acoustical properties should be good so far as resistance to the passage of sound from room to room is concerned. Also, reverberation should not be troublesome but this fault can be entirely avoided

by acoustical treatment. It seems certain that little treatment of this character will be necessary.

In general, the building is structurally sound, the chief defect in this section of the building is the ceiling of the top story which is of light wood construction. This defect should be corrected no matter what use is made of the building. This ceiling should probably be insulated to reduce the heat loss and to reduce the summer temperature in the room. The open wood stairs should be replaced with enclosed fireproof stairs. The building is well provided with windows so has excellent natural lighting and ventilation.

The Old Agriculture Building now houses several laboratories of the College of Agriculture. This building was constructed in 1900. The laboratories are therefore 44 years old. They are entirely obsolete and inadequate. If some or all of these laboratories are moved to new buildings, the space released can be modernized and remodeled to provide excellent classroom and office space. The type of construction is similar to that of the east section of the Chemistry Building which has been described. In general, the building is structurally sound. It is well provided with windows and so has excellent natural lighting and ventilation.

The Chemistry Laboratories and the Old Agriculture Building are extremely well located for use as classroom buildings for the College of Liberal Arts and Sciences. The South Campus is a more convenient location for Agricultural Laboratories.

It is quite probable that additional classroom and office space can be provided in other old buildings such as the Electrical Engineering Laboratories, and the Mechanical Engineering Laboratories, if new laboratory buildings are constructed to house a part of the work now carried on in these buildings. Space may be vacated in the Transportation Building if new Mechanical

Engineering Laboratories are constructed. Space vacated in the Engineering group of buildings will not be favorably located for use of the College of Liberal Arts and Sciences but Engineering classes which are now held in buildings in the Liberal Arts group could be shifted to buildings in the Engineering group and thereby release favorably located space.

It is proposed that, in general, funds for modernizing, reconditioning and remodeling be included under Project P. P. 3.

Prepared by: W. C. Huntington
Chairman, University Building Program Committee

PROJECT L.A.S. 5

BIOLOGY BUILDINGS

GENERAL COMMENTS

The Building Committee of the College of Liberal Arts and Sciences unanimously recommends the following program to care for those departments of the college which are concerned with various biological sciences. The items are arranged in the order of apparent urgency.

First: The plan for housing the Department of Bacteriology in modernized quarters on the first floor of the Old Agriculture Building. As you know this project was approved by your committee and the money, $90,000, for carrying it out was appropriated. But for the war the Bacteriology Department would now be occupying this space. In view of these facts and the obvious advantages of the plan, this request seems to need no elaboration. Dr. Tanner's letter, however, is attached.

Second: The construction of a new building for the Department of Entomology at a cost which we feel would not exceed $200,000. Dr. Metcalf's memorandum regarding the needs of this department has been in your hands for sometime and a sketch of the proposed building will be sent to you very soon. You will note that we are asking for very little additional building space for this department but are specifically and emphatically asking for a quite different location. This location should be chosen with special reference to the needs of entomological work and the advantages to be derived by the College of Agriculture. The space released by this department in Harker Hall is badly needed for class room use for which the location of the building is ideal.

Third: The construction of a new building for the Departments of Zoology and Physiology which might cost $500,000. We think of this primarily as a laboratory building which would bring together the scattered units of this department now housed in three buildings, Natural History Building, Vivarium, and the Goodwin St. residence. For such a building the site on Mathews St. opposite the Natural History Building would have decided advantages, particularly in its proximity to the Natural History Museum and Library, which we feel should remain in their present location. These two departments could use the class and lecture rooms in the Natural History Building. Space released in this Building would make possible much needed expansion of the Museum, the Herbarium, and the Natural History Library. The Museum already has on hand exhibits for the proper display of which at least twice the space is needed. The Herbarium has long been greatly overcrowded. The Natural History Library has already reached the limit of stack room and is constantly expanding.

We are enclosing the specific statements of need and the specific requests of the Particular departments in the Division of Biological Sciences. The recommendations of our Committee outlined above seem to us to be the most effective way of reconciling the various points of view.

Prepared by College Committee on Buildings

THE BIOLOGY BUILDING AND THE FUTURE OF BIOLOGY
in the
UNIVERSITY OF ILLINOIS

This report will concern itself with certain basic principles which must first be accepted, rejected or revised before the details of a new Biology Building can be intelligently planned.

1. Unified Division of Biology. It is generally conceded that the old Natural History Building* is least suited to the experimental phases of Biology (Physiology, Ecology), the areas representing the modern trends. From personal acquaintance with the facilities in almost all of the larger universities, I would say that we stand absolutely at the bottom. The University of Illinois is hardly within shouting distance of the procession.

To think of providing, however, for a particular discipline (Physiology) where the needs are most urgent, leaving the remainder of Biology in status quo would be extremely short-sighted. The days of autonomous "Institutes" of Physiology, Ecology, Entomology are passing. Although the Life Sciences have much in common (all the basic processes) we have behaved as though each discipline were the true interpreter of Nature, which is characterized by a oneness, only man having created separate sciences (and "departments").

* See the June 1937 prospectus for the inadequacy of the Natural History Building--its crowded condition, a superb library housed in a fire trap, a fine teaching museum also exposed to fire hazard and cramped for space. Cost of rebuilding and modernizing the Natural History Building even a layman can see would be prohibitive and would result in a makeshift at best.

Coordination need not (cannot), however, be forced by law. It should be by mutual understanding and cooperation. The first step to achieve this high aim is by cooperative housing. Proximity would tremendously facilitate the frequent exchange of ideas and prompt discussion of new developments in one field that are likely to affect one's thinking in all fields of biology (See chart on next page).

Compared with this intellectual advantage the details of architecture and exact building site are relatively unimportant.

Unification of the biological sciences and housing them together would correct at the same time the anomalous scattering of the Department of Zoology and Physiology, now housed in three widely separated buildings, the Natural History Building, the Vivarium and the Goodwin Street residence.

No wonder Animal Ecology languishes, since few students have any contact with it--ecology is like a stepchild housed in the woodshed. Our small animal quarters in the Vivarium likewise yield a minimal return on the investment because of its isolation from the mainstream of faculty and students.

The Vivarium must be abandoned! A Biology Building is the solution. Let us not worry about the machinery in the basement of the Vivarium--it is thoroughly antiquated and almost worn out.

How "fields" overlap department boundaries is seen in this chart:

ZOOLOGY

Ecology and Animal Behavior — ENTOMOLOGY — Genetics and Evolution (Phylogeny)

BOTANY

Physiology (Biochemistry) (Biophysics) — BACTERIOLOGY — Anatomy (Histology) (Cytology)

PSYCHOLOGY

AGRICULTURE

Examples:

The most exciting developments in the field of genetics at the moment lie in the study of mold (Neurospora, e.g.) bacteria and yeasts.

Dr. Severens, for example, straddles the College of Agriculture and the College of L.A. & S. and is working (in Bacteriology) on a most promising line of genetics that arose out of work on diseases of chicks done in Animal Genetics.

Dr. Barnes-Baylor in Chemistry, working with Dr. Severens in Bacteriology, may be on the eve of discovering sexual reproduction in Bacteria, by the aid of the electron microscope, owned by Chemistry.

Cellular physiology likewise oversteps department and even college boundaries, involves Bacteriology, Physical Chemistry, Biophysics, Zoology and Botany.

2. Site. Two basic principles should guide the committee in the selection of the building site.

a. It should be readily accessible to the undergraduate student body. This principle limits the available sites to those north of Gregory Drive.

b. The plot of ground should be large enough to house all of the biological sciences. Anything short of that will be the result of expediency, appeasement of individuals, compromise, lack of vision for the future, and lack of firmness on the part of our leaders.

It is my recommendation that the central committee decide this basic point: Are we to have a unified Division of Biology or shall we continue to have "competing" instead of cooperating departments as in the past?

Concrete Suggestions for Site of Building:

Site A: On Mathews between the Morrow Plot and the Woman's Gymnasium. The chief argument for this site is its nearness to the agricultural activities as well as its openness.

Site B: On Mathews between Oregon and Nevada streets.

This block would be adequate if open ground could be secured east of Goodwin.

The advantage of this site, though somewhat farther removed from agriculture, is its nearness to the proposed new Chemistry Building,* for in future the cooperation between Biochemistry and Physical Chemistry and Biology will greatly increase.

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* I visualize much closer integration of Biology with Biochemistry and Physical Chemistry, as for example in the identification of metabolic compounds within cells and tissues by X-ray diffraction, ultra-violet fluorescence, absorption of specific wave-lengths of light, infra-red photography and other methods brought out by the chemist for the solution of biological problems, whether in animals, plants or bacteria.

Site C: On Mathews opposite the Natural History Building.

This two-thirds block would be acceptable provided open ground may be secured east of Goodwin.

This site has the following advantages:

a. The Natural History Museum would be readily available, hence could remain where it is, expanding into the remainder of the fourth floor. However, the non-fireproof character of the building must be considered.

b. The Natural History Library might also remain where it is, with some room for expansion. However, the Natural History Building is a fire trap. Much of the Library is irreplaceable at any cost!

c. Some class and lecture rooms might be utilized in the old building.*

3. It is apparent that the size of the building will be determined by the site selected, the department to be accommodated and whether the library and/or the museum are to be incorporated.

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* The idea of a research building with professors' offices and laboratories for them and their graduate students separate from the undergraduate teaching is to my notion little short of vicious. Teaching and research should not be separated, nor the undergraduate from the graduate. Research should be going on where the bulk of the students may have some contact with it, however tenuous.

If the new building is to be all-inclusive, the figures as to required space presented to the Building Committee in June 1937 still hold except for very apparently dispensable accessories. I am opposed to any bizarre architecture, and favor the simple, compact type of building found satisfactory everywhere**--offices and laboratories strung out on either side of the corridors. Flexibility may be attained by means of movable (non-structural) partitions. Special needs of plumbing, wiring chemical hoods, etc., are mere details which the architect will incorporate in his plans according to suggestions of the staff.**

4. Summary for Biological Division.

Load: On February 15, 1937

94 faculty members of the Biological Division taught each year (exclusive of summer school) . . . . . .9000 students

91 chemistry teachers taught. . . . . .7500 students

Present Space . . . . 120,717 (including animal quarters)

Space needed . . . . 180,435 (including animal quarters)

Such a building, it is estimated, would house the entire Biological Division, including Museum, Library, Animal quarters, and Psychology.

For "Future Development of the Biological Sciences" see another report. Psychology is mentioned especially because there is some doubt in my mind as to whether the Department would want to leave its central location and also because of Psychology's close relation to Education and Sociology.

** Such buildings erected 30 years ago at Yale, 40 years ago at Pennsylvania, 10 years ago at Berkeley are as satisfactory today, I am assured, as when built.

Prepared by: Carl G. Hartman
Head of Department of Zoology

A. BOTANY

The physical needs of the Department of Botany can, in the opinion of the present staff, best be met by readjustment and improvement in present buildings, with little new construction. Some of these needs are listed below more or less in order of their immediate importance:

1. Herbarium.--Our Herbarium, built up through the efforts of two generations of able men supplemented by the purchase of much material not now available, is in daily use. It is much overcrowded and as soon as steel equipment can be purchased for civilian use, its size should be at least doubled. This could best be done by utilizing the two adjoining rooms in the Natural History building both of which were, until University Hall was torn down, regularly assigned to the Botany Department.

2. The Laboratories.--Those used for beginning courses should be rearranged and to some extent further equipped to make possible modern laboratory teaching. This we hope to do within the next year or two. In fact the modernization of one has been nearly completed by the use of departmental funds.

3. Micro-technic Laboratory.--This should be equipped with a hood and ventilator as soon as such equipment can be purchased. This will cost but a few hundred dollars and plans for this have already been drawn.

4. Harker Hall.--It would of course be more convenient if the laboratory and office space now occupied in Harker Hall could be given up to some other department and equal space alloted to us in Natural History Building, but the distance is not great and the need is not pressing.

5. Plant Physiology.--The greenhouses used for experimental work (chiefly in plant physiology) are of steel construction and in excellent

repair and are located as near the Natural History Building as it is possible to secure adequate room and light. Most of the valuable chemical and physical equipment used in this work is, however, housed in an old wooden residence. If in the post-war period the university undertakes a building program this might well be replaced by a small fire proof building.

6. Plant Pathology.--In normal times the department gives several courses in plant pathology. These are in large part service courses for the College of Agriculture. They are taken chiefly by undergraduate students in the College of Agriculture and graduate students in Botany and Entomology. None of them is required of Botany majors and few students from the College of Liberal Arts and Sciences elect them. More adequate provisions for instruction in these courses should be made. It is, however, my considered opinion that such facilities should be provided in connection with buildings now held by or to be constructed by the College of Agriculture which would of necessity have similar equipment. The alternative which would involve securing expensive space and providing facilities at a distance from the College of Agriculture seems to me both inefficient and unsatisfactory. This matter is here presented for consideration and possible approval by the Building Committee of the College of L.A. and S.

Prepared by: Neil E. Stevens
Head of Department of Botany

B. ENTOMOLOGY

A fundamental requirement for the work of the Department of Entomology is some space adjacent to the building where living materials for research and classroom demonstrations can be reared and kept in experimental soil plots, in out-of-door rearing cages, under varied ecological conditions. Our minimum needs in this respect are an area not smaller than 200 x 200 feet with a greenhouse and an insectary glass-house about 30 x 100 feet, a pool for aquatic insects, and some small soil plots, as well as a well-fenced area in which to house the honey bee colonies for work in Agriculture.

I wish to emphasize that the location suggested by some of our staff in Biology for a building on the square east of Mathews Steet and south of Green Street would be absolutely unsatisfactory so far as Entomology is concerned, because there would not be sufficient area for some natural, undisturbed, areas where honey bees, insects, plants, and some larger animals may be kept close enough to the offices and laboratory so that insect materials for research, class use, and demonstration could be available. That location would not give the isolation from residences and heavy traffic necessary for the protection of the plots and to protect the public from attack by the honey bees. It seems to me that the ideal location, at least for Entomology if not for all of the Biology Departments, would be somewhere east or west of the New Agriculture Building; either north or east of the Floriculture and Vegetable Greenhouses; directly west of the New Agriculture Building; or west of the Genetics Laboratory and Agricultural Engineering Building, north of the Stock Pavilion, and east of the Animal Pathology Laboratory. This would enable us to make use of the University forestry and the orchards, fields, and gardens of the Experiment Station for demonstrations in Agricultural and

Forest Entomology; and with the location of our Apicultural Laboratory out there, it would be of great advantage both to the honey bees and the Agricultural Departments, many of which depend absolutely upon cross-pollination of the plants by honey bees for successful production of crops.

I feel sure that, at the close of the present war, there will be a greater appreciation of the importance of Entomology than ever before. That appreciation is already becoming intensified, especially among the men in our military service, who have suffered so much from the annoyance and the injury of insect predators and parasites and the very highly fatal diseases disseminated solely by insects, mites, and ticks; and also by farmers and others vitally interested in food production; by storekeepers and others who are seriously concerned with the safe storage of grain, foods, clothing, fabrics, and other human possessions which are subject to complete destruction by household and stored product pests.

I have tried to indicate on the accompanying pages the size and nature of building space necessary for Entomology in normal times and especially after the war. It seems to me it would require a three-floor building about 48 x 140 feet. We have had to refuse, this winter, donations from three or four companies who wanted us to do research work testing the efficiency of insecticides they are manufacturing; because we do not have room enough for any more work on toxicology in this building. The following statement is a tentative suggestion of the most satisfactory arrangement of the various rooms outlined for our needs.

Rooms 1 and 2. Two rooms about 24' x 36' for lectures, laboratory and quizzes in Entomologyl, four sections accommodating about 32 students in each room. Present space for this purpose is 309 Harker Hall, 27' x 58'. In

normal times there were about 50 students per section and will doubtless be more after the war. Needs: Laboratory tables with electric lamp for each student. Lots of blackboard space, wall space for charts, projection lantern, sink, and lockers for student use. Suggested that it be on the second of three floors.

Room 3. Classroom for lectures, laboratory and quizzes in courses 14, 21, and probably 3, 4, and 9, about 24' x 24'. Present space used is 310 Harker Hall, 21' x 30'. The same equipment needed as for Rooms 1 and 2. Second of the three floors preferred.

Room 4. Storage room for general insect collections at least 24' x 44'. Now in Room 304 Harker Hall, 25 x 44. Should be near classroom 3 or 5.

Room 5. Classroom for lectures, laboratory and quizzes in courses 7, 8b, 10, 22, 107, and possibly 3, 4, or 9, about 24' x 24'. Present space used is 312 Harker Hall 21' x 30'. The same equipment needed as for Rooms 1, 2, and 3. Maybe on top-third-floor.

Room 7. A room at least 24' x 48' on the ground floor or basement for laboratory work in Insect Control, Ent. 20, and insecticide research including the preparation and demonstration of spraying, dusting, fumigating, and mechanical control measures, and the compounding and testing of new insecticide materials. This room requires hoods, exhaust fans, vacuum chambers, humidity and temperature-control chambers, gas compressed air, filtered water, cold brine and heavy electric current. It must be located so that a truck can be driven close to it and close to outside insectary-greenhouse. Present space for this work is 107 Harker Hall, 15' x 21' and 109 Harker Hall 21' x 28' --very inadequate.

Room 8. Beekeeping Work Room for wax rendering, honey storage tanks, hive assembling and repairs, about 24' x 40'. Requires electric power, water, floor drain, and outside entrance. It should be on the ground floor adjacent to the apiary space; and directly below Room 10 for gravity movement of extracted honey. Present space is Room 2, Vivarium Building 20' x 40'.

Room 9. Laboratory and lecture room for beekeeping courses and research in apiculture, about 30' x 40', the space along the outside about 6' x 30', separated in part by sliding doors for a set-up of demonstration colonies of living honey bees with outside entrances for the bees. Should be on the ground floor adjacent to Room 8. Present space is Room 104 Vivarium Building, 20' x 40'.

Room 10. Room directly above Room 8, 24' x 40', for honey extracting. The honey to flow by gravity to storage tanks in Room 8. Needs gas, steam, hot and cold water, compressed air, cold brine, filtered water, electric power and an outside unloading platform. Present space is Room 110 Vivarium Building, 20' x 20'.

Room 11. Lecture room providing seats for about 100 students needed 4 to 8 hours a week, especially for Entomology 2, about 24' x 48' with storage space at least 6 x 9 feet adjacent to the lecture platform for storage of demonstration materials and equipment from period to period. Maybe on the top-third-floor. Present space for this purpose, Room 202 Harker Hall, 27' x 40'.

Rooms 12 to 17 or 19. Need six to eight rooms about 12' x 14' or 10' x 18' or equivalent alcoves in a large room for graduate students' research work. Problems in Entomology nearly always require close observation of living materials with cages, food plants materials or host animals, control

chambers, and experimental apparatus requiring 50 to 60 square feet for each investigator. It would be best to have at least two such rooms on each of the three floors, close to the facilities needed for the special problems. Water, gas, and electricity and ample book shelves needed in each room, which may accommodate two graduate students. At present our graduate students are scattered about in Rooms 104, 203, 304, 307, and 310 Harker Hall.

Room 22. Department Office, 18' x 18' with an adjacent connecting room 12' x 18' for department files. Needs wash bowl, telephones, and electric current. Present space 303 Harker Hall, about 11' x 26'. Should be on the second floor near front entrance.

Rooms 23 to 28. Need six offices for permanent staff members about 12' x 18' each with a private research laboratory in an adjacent connecting room about 10' x 18'. The research laboratories need sinks, gas, and outside windows. One of these should be on the ground floor adjacent to Room 7; another on the ground floor adjacent to Room 9; another adjacent to Room 22, for the head of the department; one on the third floor adjacent to Room 4 or 11; another on the third floor adjacent to Room 5; and the sixth one on either the second floor near Room 3 or on the third floor. At present we are using Rooms 101, 301, 306, 308 Harker Hall and Room 104 Vivarium as offices.

Room 29. A conference and seminar room about 18' x 24' needed for staff meetings, Hexapoecia Club meetings and various committee conferences. Should be near the department office on the second floor.

Room 31. Preparator's Room for mounting, preserving sectioning, and hermetic sealing of insect specimens for class use, about 18' x 24'. Present space for this purpose Room 311 Harker Hall, 20' x 27'. Requires sink, filtered water, compressed air, gas and electric current. Preferably on second

floor near department office.

Room 32. Storage rooms for chemicals, glassware, insect cages, collecting nets, boxes, bottles, trays, sprayers, dusters, fumigating equipment, and other supplies. At present we use the attic floor, Room 320 Harker Hall and five stacks or floors off of Room 311 Harker Hall, each 9' x 25' for this purpose. The five stacks are the only fire-proof space we have and contain excellent shelves and stairways which I trust can be transferred to the new building for our continued use. I would suggest that they be distributed over the three floors, located at one end of the building or along one side with entrances from each floor, an elevator and stairways. Space on each floor about 12' x 48' would house the present shelving and be much needed.

Room 33. Work Shop about 18' x 20' for making insect cages and various wooden and metal equipment. Should be on the ground floor near the Insecticide Laboratory. At present it is crowded into Room 109 Harker Hall.

Room 34. An artist's room about 18' x 20' with special roof lighting on the third floor, for making wall charts of insects, mimeoscope drawings, etc.

Room 35. A dark room for photographic work and Apeco photocopying without any windows and an entrance-way to exclude light from the opened door. About 16' x 24' on second or third floor. Present space a room inside 304 Harker Hall.

There should be a small toilet-room and lavatory on each floor, at least one of them for women, the other two for men.

It is very essential that we have an insectary and greenhouse outside the main building, about 30' x 100' for rearing insects needed to test the efficiency of new insecticides, for growing plants for them to feed upon

and for housing some small animals as hosts for parasitic species needed for research in the control of pests, life-histories of insects and various biological research problems. At present we have a small greenhouse 12' x 14' off of Room 109 Harker Hall and another 24' x 24' at the Vivarium. The Insectary Greenhouse should be located South of the building near Room 7.

This could be either an isolated building or a part of a large general building for several or all of the Biological departments. A separate building or wing would be better because it would be important to have as many outside windows as possible, especially in the rooms used for laboratory work, in private laboratories, and rooms for graduate student research work.

Prepared by: C. L. Metcalf
Head of Department

C. PSYCHOLOGY

The only pressing need of the Department of Psychology in the way of a building so far as can now be foreseen, is in connection with the Psychological Clinic. To the public this is known as the Counselling Center. This clinic was inaugurated two years ago. It is housed in the first floor of 106 South Goodwin. To that address in the course of a year came about one hundred children and a certain number of parents, and a few teachers, and social workers. The educational purpose of the clinic is to provide living cases of child behavior problems, and thus opportunities for observation, testing, and general diagnosis, needed for offering instruction and training (at various levels) in Clinical Psychology. It is hoped that this work will be further developed to the point where we can turn out graduate students well trained for the profession of Clinical Psychologist.

Our present quarters are fairly satisfactory, but it is improbable that the University will allow the old frame house, formerly a private dwelling, to stand indefinitely. Our best hope of securing adequate permanent quarters seems to be in connection with the plans of Dean Benner for a new building. It is my understanding, obtained directly from him, that he has included adequate space for the Psychological Clinic in the plans which he has proposed. While the quarters proposed by Dean Benner would be associated both physically and operationally with space for other types of work with children, the work in clinical psychology, and the training of clinical psychologists is to remain the Department of Psychology.

The only request from the Department of Psychology, then, is that we be allowed to continue to use the present quarters at 106 South Goodwin until new quarters are available. Since there has been no intimation that we

shall not be able to do so, I do not know that this request implies the need for any new action at all at the present time.

Prepared by: Herbert Woodrow
Head of Department

SECTION 4

PROJECTS PROPOSED BY

THE COLLEGE OF AGRICULTURE

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GENERAL COMMENTS

The greatest need of the College of Agriculture at the present time is adequate laboratories for research and teaching. Included in this is a need for demonstration classrooms in which materials, charts, films, and other visual aids can be appropriately used. As compared with states having a comparable agricultural production and wealth, Illinois is poorly equipped with facilities of this kind. It should be noted that in addition to being one of the first states in agricultural products, for example, meat packing, dairy manufacturing, canning, and processing corn and soybeans. It stands equally high in the manufacture of farm machinery and equipment. The agriculture of Illinois is devoted very largely to the production of foods. As now organized the college combines the production and consumption areas with a substantial amount of research and teaching in processing fields, particularly in dairy manufacture, canning, and meats processing. That part of the research work of the college which must be done in the indoor laboratories is largely housed in the Old Agriculture Building which was constructed in 1900. The most recent laboratory building is the one for dairy manufactures constructed in 1925. Great strides have been taken in agricultural research since these buildings were constructed. The research program of the college has expanded many fold and the need for further expansion is great. The staff has grown from 50 in 1900 to 315 in 1943-44.

The number of students enrolled in the college has grown to 1,649 in 1940-41. While the percentage of the population engaged in agriculture has declined the need for agricultural research and teaching has steadily

increased. Actually much of the research is in the interest of all consumers as much as it is in the interest of agricultural producers. There follows a summary of the laboratory buildings urgently needed by the College of Agriculture, including its Department of Home Economics. In setting up the total number of square feet included in the combined laboratory needs only 35,000 square feet was allowed for animal pathology. We believe that the University should establish a school of veterinary medicine, but in that case the appropriation for buildings and equipment which is indicated to amount to $1.500,000 should not be included in the allocations to the College of Agriculture.

The most expensive of the minor buildings is probably the central unit for the group of dairy barns on South Lincoln Avenue. This is estimated to require approximately $40,000 at present rates.

Attention should be called to the proposal to attach a meats laboratory and a holding barn to the stock pavilion. The holding barns might be incorporated in the present structure while urgent repairs are being made.

More detailed statements covering each item in the list follow.

Prepared by College Committee on Buildings:

C. M. Woodworth
Deane G. Carter
Lita Bane
Robert B. Hudelson, Chairman

SUMMARY OF PROJECTS

PROPOSED BY

COLLEGE OF AGRICULTURE

Number		Net Floor Area	Page
Ag. 1	Animal Pathology and Hygiene Building . .	35,000 sq. ft.	4
Ag. 2	Home Economics Building	100,000 " "	8
Ag. 3a	Animal Nutrition Laboratory	14,000 " "	13
Ag. 3b	Agronomy Laboratories	46,000 " "	21
Ag. 3c	Alterations in Horticultural and Floricultural Buildings	------	33
Ag. 3d	New Space for Department of Forestry. . .	------	42
Ag. 4	Meats Laboratory.	12,000 " "	46
Ag. 5	Agricultural Engineering.	50,000 " "	50
Ag. 6	Dairy Chemistry and Bacteriology Laboratories .	30,000 " "	55
Ag. 7	Completion of Pure Bred Dairy Barn. . . .	8,500 " "	59
Ag. 8	Machinery Shed and Farm Shop.	7,000 " "	61
Ag. 9	Holding Barn at Stock Pavilion.	11,000 " "	62
Ag. 10	Agronomy Greenhouses.	7,000 " "	63
Ag. 11	Horticulture and Forestry Greenhouse. . .	2,500 " "	63

PROJECT AG. 1

ANIMAL PATHOLOGY AND HYGIENE BUILDING

I. DEPARTMENT LOAD

For 25 years the department of animal pathology and hygiene has been housed in the old beef cattle barn. This building is not adapted to animal pathology and hygiene activities, including teaching, research, and public service. However, three undergraduate courses have been developed for agricultural students in anatomy and physiology of farm animals and in the prevention of nutritional, contagious, and non-contagious diseases in farm animals. Five graduate courses also have been developed for students working toward the M.S. and Ph.D. degrees in animal pathology and hygiene. Student enrollment at present is reduced, but even with a small number of students (20), the facilities are inadequate for undergraduate and graduate teaching.

The facilities for research are also inadequately provided for in the old beef cattle barn, both as to room and adaptability. The present facilities for research constitute a hazard to the workers in handling various infectious materials and limit the quality of work which can be done. The public service demands, including diagnosis of animal diseases conducted in cooperation with the State Department of Agriculture, also overtax the facilities of our laboratories. Last year, more than 75,000 specimens were handled in the diagnostic laboratories, and specimens submitted to the laboratory this year are on the increase. It is anticipated that the public service load will continue to increase with the crowding of animals on Illinois farms.

II. PRESENT SPACE

The old beef cattle building which houses the department of animal pathology and hygiene is not designed or constructed for research, diagnosis, or teaching in animal pathology and hygiene. A total of approximately 12,000 square feet of floor space is provided. Four separate laboratory activities are crowded into one laboratory. Furthermore, a single room must provide both office space and the major laboratory working space for five persons--two full-time pathologists, one 2/3-time pathologist, and two full-time technicians. The partitions and ceilings are of a temporary nature, creating an uncontrollable dust hazard. Staff members are obliged to have their desks in the corners of laboratory rooms in which lethal viruses are handled and in rooms where these lethal viruses are propagated. A minimum of 60,000* square feet is needed to house the present activities of this Department. The construction should be fireproof, including concrete, steel, and brick, with impervious interior finish with autopsy rooms, cold storage rooms, laboratory equipment, incubators, animal rooms, and incinerators. At least part of the building, including offices and laboratories, should be air-conditioned. The present space is inadequate and unsuitable and of a type of construction that should not be considered as a part of the future building needs.

III. POST-WAR DEVELOPMENTS OF A VETERINARY COLLEGE

In addition to a building to house the department of animal pathology and hygiene, a veterinary college building with a minimum of 100,000 square feet of floor space of a permanent type of construction mentioned above should be considered in the post-war building plans of the University. It would not be advisable to provide inferior equipment for

*This figure has been changed from 35,000 after talking with Mr. Stouffer.

either the veterinary college or the department of animal pathology and hygiene. In addition to teaching agriculture students in animal anatomy and physiology and the prevention of animal diseases, undergraduate instruction should be made available to Illinois boys who desire to specialize in veterinary medicine leading to a degree. The overcrowded condition of veterinary schools in other states has largely prevented Illinois boys from matriculating in veterinary medicine, since preference is given to applications from resident students. It appears necessary in the future protection of the livestock industy of Illinois that arrangements be made at the University of Illinois to give instruction in veterinary medicine. The California Legislature recently appropriated $1,000,000 for a new veterinary college as a post-war activity.

IV. PROPOSED NEW SPACE

For the department of animal pathology and hygiene, not including the veterinary college, a net floor space of not less than 60,000 square feet is desired. This building might be located in the agricultural group east of the dairy manufacturers' unit or in this vicinity. Special laboratory services, such as gas, high pressure steam, compressed air, vacuum and special incubators, autopsy and inoculating rooms, together with surgical wards and quarters for animal patients, are essential. Modern facilities for research are desired for the study of diseases of animals alone, as well as diseases of animals communicable to man. In addition to the requirements for research, graduate and undergraduate laboratories, classrooms for training of both agricultural and veterinary students are essential. The building needs of the department of animal pathology and hygiene should, if possible, be coordinated with the veterinary college buildings.

V. FUTURE DEVELOPMENTS

The developments of the future beyond the immediate post-war period for the department of animal pathology and the veterinary college can be provided for in the immediate post-war planning.

VI. SUMMARY OF BUILDING NEEDS

1. A modern department of animal pathology and hygiene building, approximating 60,000 square feet.

2. A veterinary college building - approximately 100,000 square feet.

3. The efficiency of building in (1) and (2) should be coordinated and so arranged as to economize on common activities.

4. Building in (1) and (2) should be located on the southwest campus in the agricultural group.

5. Building in (1) and (2) should be a permanent type of fire-proof construction with concrete, steel, brick, and other impervious materials for floors and walls.

Prepared by Robert Graham

PROJECT AG. 2

HOME ECONOMICS BUILDING

I. DEPARTMENT LOAD

The following table shows the development of the Department of Home Economics from 1913, when the present building was completed, to 1940-41. We have selected 1940-41 as the last normal year, and before Women's Physical Education moved back into the building, which is assumed to be a temporary arrangement.

	1913	1940-41
Total number of students (both majors and non-majors)	358	870
Number of teachers, research workers, and extension workers	11 1/	58
Number of office workers	1	13

The staff teaching load for 1940-41 was as follows:

	Full-time equivalent	Students per teacher	Clock hrs. per teacher	Sem. credit hrs. per teacher
First semester . .	19.18	59.5	14.8	6.8
Second semester. .	19.75	62.	15.1	8.1
Summer session,1940	6.5	28.	13.5	5.2

A number of new occupations have opened for home economists, such as those of airplane stewardess, food inspector, and industrial nutritionist. There is a growing demand for home economists in the fields of research, teaching, and extension, as well as to serve in foreign countries.

1/ In 1913 there were no extension workers.

Experienced women in business predict an unusual demand for home economists in that field immediately following the war.

Dr. Marietta Stevenson, Professor of Social Administration, reports that there is an increasing demand for home economists in the social service field.

Research in all areas needs to be expanded in order to strengthen the teaching program.

Some courses for non-home economics majors are now offered, and the number should be increased.

There is demand for persons trained in hotel management, and several home economics departments offer such training. We are including space in the proposed building for teaching such a course.

These additions to our curriculum should stimulate registration in the Department.

The enlarged program will require additions to the staff. The number will depend upon the increases in student enrollment and the scope of the research.

We are no teaching three courses in the Occupational Therapy curriculum. These are taught in the Woman's Building.

A considerable amount of our research in the area of food is of direct value to agriculture.

II. PRESENT SPACE

The first unit of this building was built in 1905. The addition was built in 1913.

In 1940-41, which we have taken as the last normal year, we occupied 23,000 square feet of space. Our needs as estimated by the staff total 96,000 square feet.

The present building is inconveniently arranged and is both inadequate and unsuitable for teaching some courses. The home management course is an example. In this course, the students are required to live in an apartment for a period of four weeks. The quarters provided in the present building are unsafe, badly crowded, and not well adapted to the needs of the course. The estimated floor space for a new building includes two apartments, each adequate to house four or five students and a resident instructor.

The lack of storage space is one of our serious difficulties. We are handicapped in the amount of illustrative material that we can have for use in classes because we do not have the storage space for it.

A great deal of home economics work is laboratory work. At the present time, laboratories are crowded. Research and undergraduate teaching must be carried on in the same laboratories. There is no space in our building for our larger classes and we have no provision for teaching by the demonstration method. A large lecture room equipped for giving demonstrations is badly needed.

III. POST-WAR DEVELOPMENT

There is every reason to believe that the increase in the number of registrations which was taking place when the war came will continue following the war period. The accelerated interest in human food and nutrition caused by the war is likely to continue, since the public has become conscious of the important role food plays in health. There is also growing interest in the field of child development and family relations. The whole field of household management is also expanding.

IV. PROPOSED NEW SPACE

According to the estimate of needs made by the staff, we should have about 100,000 square feet of space for use in teaching and research work in the fields of:

Foods and Nutrition

Textiles and Clothing

Costume Design

Housing and Home Furnishings

Household Management

Child Care and Family Relations

Institutional Management

Hotel Management

and to provide for suitable offices for the members of the staff who are doing extension work.

The construction of the new building should be fireproof. The laboratory recommendations are made on the assumption that the building will be air conditioned.

All foods and nutrition laboratories will need to be equipped with running water and gas. Both hot and cold soft water will be needed in addition to drinking water.

Compressed air and vacuum should be provided in food and nutrition laboratories.

Special rooms will be needed for the care and feeding of animals to be used for research and teaching purposes.

A vault for research and other records, instrument rooms, such as balance rooms, Kjeldahl and digestion rooms, and a distillery room for making distilled water which is used in large quantities in our research, will be needed.

A constant temperature and humidity room will be needed.

The space requests are in part to relieve present congestion and in part to provide suitable quarters for the work of the Department. If the plans as suggested are carried out, the building will provide for what we might expect as an increase in numbers of students and research facilities for a considerable period of time.

V. FUTURE DEVELOPMENT

Home economics stands in great need of more research and better trained personnel, particularly at the graduate level. The University of Illinois probably more than any other university set the early standards in the field of home economics and is in an advantageous position to make significant contributions toward improving the homemaking in the state and providing leaders in a professional field which is rapidly growing. The growth of the American Home Economics Association from a membership of 830 in 1909 to more than 15,000 in 1942 is an indication of the increasing importance of this area of study.

VI. SUMMARY

Due to the expansion of the field of study and research and the increase in numbers of students as well as the special requirements of a modern home economics department, the present building is both unsuitable and inadequate. The state of Illinois needs to have a well-housed home economics department if the homemakers and persons training for salaried professional work are to be well served.

Prepared by College Committee on Buildings

PROJECT AG. 3a

ANIMAL NUTRITION LABORATORY

I. INTRODUCTION

Any building program which affects the Department of Animal Husbandry should take into account the very great desirability of bringing the various divisions of the Department together in one compact unit. Administratively, this would be a vast improvement. There is no doubt that the integration of the physical units of the Department would react favorably on its service to students and to the public as well as on its research program. Such a change is greatly needed.

Even before the war, pressure was being felt for the developments requested by the Animal Husbandry Department. The emphasis being given during the war to many different kinds of food problems and the developments in the field of nutrition which the war has stimulated and which will be even more acute in the post was period, underlie the major building requests made by the Department.

Brief statements follow in support of four items:

1. A machinery shed and farm shop. (Project Ag. 8)
2. A holding barn. (Project Ag. 9)
3. A nutrition laboratory. (Project 3a)
4. A meats laboratory. (Project Ag. 4)

Provision should be made in Numbers 3 and 4 for suitable lecture-demonstration classrooms. The present lack of adequate space of this nature is a terrific handicap to good teaching.

II. DIVISION LOAD

The Division moved into its present quarters in the Old Agriculture Building about 1913, and since then it has expanded into the court rooms 128 and 129 (hollow tile construction) about 1928, and has occupied more space on the second floor of the east wing (about 1935) and on the second floor of the main section of the building (Room 218).

Our present instructional load relates to one course in the intermediate group and 5 graduate courses. We have 3 staff members on the teaching staff and a normal student registration of about 40 per year. The course on methods of vitamin assay, just approved, will probably attract 10 to 15 graduate students initially and probably more later. We have no means of estimating probable expansion in instructional load during the post-war period and later.

The activities of the Division, with its 14 staff members (including 3 CPS men) are very largely of an experimental and research nature at the present time, financed by state and federal funds and grants from industrial organizations. It is expected that, in the post-war period, greater demands may be made on our research services both by government agencies, especially if O.S.R.D. survives the war, and by industrial organizations. Our program of research supported by state funds and U.S.D.A. funds has steadily expanded in the last 20 years and it is hoped and expected that it will continue to do so.

The Division performs technical services for other divisions of the Department in the way of routine analyses of feeds and rations, and occasionally special analyses for vitamins, minerals, etc. In Animal

Husbandry 119, and later in Animal Husbandry 120, the Division performs (or will perform) important instructional services for students of its own and other departments in laboratory methods in animal nutrition and in chemical, microbiological and biological methods of vitamin assay.

III. PRESENT SPACE

The Division of Animal Nutrition now occupies 16 rooms, covering 7174 Square feet of floor space, in the "500" wing of the Old Agricultural Building. Much of this wing was made over for the use of this division about 1913, although the wing itself is much older. The walls are of brick, the floors of the first floor only are of concrete, and the interior is mainly of wood construction. No part of the wing is fireproof in any sense of the word. Neither the size, shape, construction, nor the arrangement of rooms is satisfactory for the chemical and biological research activities of this division. We are so restricted as to space that one of the most important activities of the division, namely the training of graduate students, is definitely limited to four or five majors in this field. The teaching activities of the division are in the hands of Professors H.H. Mitchell and T. S. Hamilton and Dr. B. Connor Johnson. With this teaching personnel, assisted by eleven additional research staff members, and with over 200 published contributions, mainly in scientific journals, the Division of Animal Nutrition should attract at least ten times the number of graduate students which can now be accommodated.

In addition to lack of space and suitable facilities, the following are a few of the handicaps under which the division now and has been operating:

1. Our analytical balances are on the second floor of a building which shakes almost continually so long as motors are running in any part of the building.

2. Our very sensitive spectrophotometer, photoelectric colorimeter, and photofluorometer are also on the second floor which not only shakes, but, because of loose windows, doors, floors, ceilings, and walls, are subject to dust, dirt and light sources. These instruments cannot be satisfactorily used under these conditions.

3. The electric wiring is so greatly loaded that, not only are we continually blowing fuses, but the fluctuation in voltage from capacity loading, makes it impossible at times to use some of the instruments mentioned above.

4. Water facilities are inadequate in most of our laboratories and we cannot use some sinks.

5. Practically every window leaks so badly that when it rains, buckets are set on the sills to partially prevent water from flooding the rooms and ruining instruments.

6. With the exception of one laboratory, all are adjacent to the tin roof covering the center area of the building. Temperatures of 114° F. are common in these rooms during the summer.

7. Much of our animal research work is discontinued during the summer because of inadequate air-conditioning for our animal rooms.

8. Our experimental work with small laboratory animals is carried out in an environment filled with roaches, mice and occasionally rats. In spite of splendid cooperation from the Sanitary Engineer's office, there seems to be no permanent relief from this condition.

9. There is not a single room available for staff conferences, seminar classes, etc.

10. Work with "trace" mineral elements is done under most unsatisfactory conditions. The shaking of sensitive balances and other instruments, the unsteadiness of electric currents, and the loose construction of the rooms, making dust unavoidable, are some of the difficulties encountered.

11. Much of our vitamin work is done by the use of bacteriological technics. It is not only impossible to do the best work of this kind under our present conditions, but I am ashamed to have visitors see the conditions under which we are working.

12. We have not one room suitable for gas analysis.

13. There is neither men's nor women's was rooms in our entire wing of the building.

14. We have neither vacuum, air-pressure, nor distilled water lines.

15. Our refrigerating facilities for preserving samples and solutions are almost negligible. At present Professor Bull is permitting us to use several lockers in his small unit. Without the use of these, we simply could not keep perishable samples, supplies and solutions.

16. Our space facilities at present prevent all but a minimum of research in swine and poultry nutrition. This is a deplorable condition expecially in view of the need of such information and particularly in a state in which the swine and poultry industries are of such magnitude.

As to the possible use of the space evacuated by the Division of Animal Nutrition, provided new space is given, it would make room for some of the expansion of certain groups in the College of Liberal Arts and Science - an expansion obviously necessary in the immediate future.

IV. POST-WAR DEVELOPMENT

The Division should share in the general post-war development anticipated for the University as a whole. No reasons are evident for believing that the expansion should be appreciably less or greater than for other units of the University.

V. PROPOSED NEW SPACE

On two previous occasions estimates of space needed by the Division of Animal Nutrition, have been made. In 1939, the estimate was 12,000 square feet. The estimate made in 1942 called for the same area. The present estimate calls for 40 rooms of various specifications totaling 14,000 square feet. Basement and first floor space would be required for large animal rooms, large pieces of equipment such as metabolism stalls and crates, respiration chambers, storage, etc. Second and third floors could be used for offices, small animal laboratories, chemical laboratories, etc.

The following is a list of rooms, many of which call for special construction and facilities, needed by the Division of Animal Nutrition:

1 office for Head of the division
1 office for associate chief of division
1 office for secretarial staff
1 office for abstractor
1 or 2 rooms for files and reprints
1 room for abstract card file
1 calculating room
1 fireproof vault
1 fireproof room for expensive chemicals, volatile solvents, etc.
1 large laboratory for general chemical work (electric ovens, furnaces, ventilating hoods, extraction apparatus, etc.)
1 large student laboratory
1 especially constructed room (dark) for special apparatus such as spectrophotometers, photofluorometers, electric colorimeters, etc.
1 bacteriological laboratory with autoclaves, incubators, microscopies, pH meters, etc.

4 small laboratories for 4 graduate students
2 small laboratories for 2 staff members each, including office space
1 room with solid floor for analytical balances
1 wash room and sterilizers for equipment
2 rooms for housing breeding colony of small experimental animals (air-conditioned)
2 rooms for housing small laboratory animals on experiment (air conditioned)
1 or 2 rooms for experimental work with large animals (air-conditioned)
1 large refrigerator room for preservation of samples
1 freezer locker room with 30 lockers for storage at 0° C. or less
1 Kjeldahl room for nitrogen determinations
1 room for storage of chemicals and laboratory equipment
1 seminar and conference room
1 room for mills, mixers, etc., needed in the preparation of samples
1 feed storage room
1 gas analysis room (air-conditioned)
1 room for small type respiration apparatus (air-conditioned)
1 cloak room
4 extra rooms - use to be determined later

A unit that would satisfactorily meet these requirements should have adequate electric power, water, gas, steam, vacuum and air-pressure lines, water drainage, insect-proof walls, floor, windows, and ceilings, control of light sources, and other special features characteristic of a modern chemical and animal laboratory.

VI. FUTURE DEVELOPMENT

It is hoped and expected that, sometime in the future, because its field extends beyond departmental limits, the Division of Animal Nutrition will become a separate Department in the College of Agriculture, or will be absorbed into a general nutrition department. Such an administrative rearrangement should stimulate a coordinated expansion along all lines of nutritional research, and should aid in attracting graduate students interested in the field of nutrition but having no special interests in animal husbandry.

If a Food Institute is established at the University of Illinois, according to tentative plans, the impetus of this new organization of all interests pertaining to food production and use, should extend to the Division of Animal Nutrition, both with reference to teaching and to research.

VII. SUMMARY

The Division of Animal Nutrition, with two full professors, one assistant professor, and eleven research staff members, occupies at present 16 rooms, totaling 7174 square feet of floor space in the Old Agricultural Building. The space occupied is entirely inadequate both with respect to area and construction. Teaching and research are severely limited particularly by insufficient electric power, improper construction of walls, floors, and windows, and unsteadiness of floors, water drainage, vacuum and air-pressure line, by insufficient refrigeration and air-conditioned animal rooms. An estimate of adequate space calls for about 40 rooms, many of which should be especially constructed or furnished, and a total floor space of 14,000 square feet. Basement and first floor rooms are required, although second and third floor rooms could also be used.

In order to maintain its intimate contacts with other science divisions, both in instructional and research fields, the Division of Animal Nutrition should be housed in reasonable proximity to these divisions, and should not be isolated from them on the far south campus.

A considerable expansion in teaching and research in animal nutrition may be expected in future years, particularly if all nutrition work is centralized and coordinated in a general nutrition department, or as an integral part of a Food Institute.

Prepared by College Committee on Buildings.

PROJECT AG. 3b

AGRONOMY LABORATORIES

I. DEPARTMENT LOAD

The Agronomy Department teaches four undergraduate, 13 advanced undergraduate and graduate, and six graduate courses. The present instructional load is not heavy, as this work is distributed among the staff, most of whom are engaged in both teaching and research, a few being engaged in research only. As a policy, the department has held down to a minimum the number of courses offered.

The total registration in Agronomy courses for the three-year period just passed is as follows:

Academic Year	Total Registration
1940-41	773
1941-42	566
1942-43	343

It is expected that, in the post-war period, the registration will return to the peak reached in 1940-41, but it is doubtful if it will greatly exceed that. Some increase could be handled without additional staff. However, our teaching load may be greatly increased in the post-war period and beyond by demands for a short course and extension courses in agriculture; by demands for short courses for special groups as farm managers, land appraisers, soybean processors, and the like; by an influx of foreign students; by a greatly stimulated interest in research work leading to an expanded graduate school; and by demands for special instruction from industry, as the hybrid seed corn industry. If these demands develop to the point where action is necessary, then certain staff additions with corresponding space additions would be required.

Attention should be called to the present very serious lack of suitable classrooms in the Old Agricultural Building. Only one classroom of any size; namely, Room 302 (836 square feet) is available, but this is not equipped for demonstrations. A great deal of material has to be carried from the Old to the New Agricultural Building and back again for classes. Classrooms, both lecture and recitation, are badly needed, which are equipped for exhibiting and using demonstration material and showing slides.

The department is obligated by official agreements to house certain cooperating agencies, as the Soil Conservation Service and Divisions of Cereal and Forage Crops and Diseases, U. S. Department of Agriculture. It also maintains for the public a soil testing service which requires considerable laboratory space. The services rendered the public by our extension specialists in soils and crops are significant, and they are expected to expand greatly in the post-war period and beyond.

Agronomy is primarily a research department. While much of its experimental work is conducted in the field, a significant part is done in the laboratory. Hence, well equipped laboratories are needed for chemical analyses of soils, fertilizers, and crops; physical analysis and classification of soil types; examination of crop and weed seeds; determination of test weight, disease damage, and moisture content of grain in connection with yield tests; bacteriological and pathological investigations of soils and crops, etc.

In the post-war period increased food production will likely be stressed, calling for additional research and hence additional man power.

This will mean expanding current studies to include: important soil groups not yet investigated, as forest soils in northern Illinois, shelly alkali soils, poorly drained soils on Wisconsin till, and sandy soil groups; new kinds of fertilizers, particularly nitrogen rendered available because of wartime changes; composition and quality of crop strains bred for special purposes; soil organic matter investigations, and microbiology of Illinois soil types; problems connected with seepage of water in pond construction; physical properties and structure of soil types.

II. PRESENT SPACE

The Agronomy Department occupies a portion of the Old Agricultural Building and all of the Agricultural Annex. The net floor area is 32,850 square feet. The Old Agricultural Building was constructed of brick about 1900 and is inadequate and unsuitable for the following reasons.

1. Faulty arrangement results in dividing the work of single divisions and in waste of space. Large laboratories do not permit different types of chemical work which interfere with each other and must be separated.

2. There is almost complete lack of individual laboratories for division heads or other members of the staff. The large laboratories designed for undergraduate student use cannot be efficiently used for staff research work.

3. The lack of sufficient and well equipped classroom space has already been mentioned.

4. Condition of building is poor. Ceilings are leaky and permit dirt from attic or floors to sift through. Most floors in chemical laboratories are splintery and dusty and prevent accurate chemical work. Much trouble is experienced from defective plumbing and radiators.

The Agronomy Department is not able to release any of the space it now occupies for other University needs till space is provided in a new building. The proposal has been made that, when such space is provided, the Chemistry and Bacteriology Departments will take over the Old Agricultural Building.

The present greenhouse space under glass amounts to 6,000 square feet, the adjacent wire enclosure being 1,500 square feet. The glass house was built more than 30 years ago and is not suitable for present needs. Rooms are large, costly to heat, and cannot be controlled as to temperature and humidity. Furthermore, there is no service building or space for storage of soil, or for preparation of soil, potting, and other work. Results are also adversely affected by proximity of trees and buildings to the south.

III. POST-WAR DEVELOPMENT

Plans drawn up by the separate divisions of the department together with contemplated increases in staff members are as follows:

1. Soil Fertility. To fulfill its obligation to the state a modest increase in man power in the form of a permanent, stabilized status shall have been reached (about six years) are as follows:

One full-time soil chemist for research in new fertilizers, their soil reactions, plant availability, and the chemical soil requirements for extra high yields (up to 200 bushels of corn or equivalent in other crops per acre).

One full-time biochemist to develop the field of crop nutrition and metabolism and the application of spectroscopy and microchemistry to this work. This work also embraces the relation of soils and plant composition to animal and human nutrition.

Two full-time chemists to take care of routine service work to other divisions in Agronomy; namely, Soil Physics, Crop Production, Plant Breeding, and Soil Experiment Fields. This work is inadequately attempted by hour-work by students. One of these may be divided into three part-time positions.

One full-time man in the newly inaugurated Soil Testing Service, with prospect of further increase. This was initiated with one man half of whose salary is permanently provided, the other half being borrowed from a man on military leave.

One half-time clerk for making computations and keeping records to supplement the full-time present position as a result of the expansion.

2. Soil Physics. Stock Ponds. The increasing shortage of water and the entire absence of underground water in some regions of the state indicate the need for storage ponds.

In some regions of the state seepage from the ponds constructed decreases or entirely destroys their usefulness. A state wide study is needed prior to the widespread construction of ponds to determine the regions where seepage is a danger, the causes of seepage and methods of overcoming the difficulty. One qualified man and laboratory space for one man are needed for the study of this problem.

Deterioration in the Physical Condition of Soils. Observation and the testimony of farmers indicate that some of our best soils are deteriorating physically. The symptoms observed are increasing difficulty of forming seedbeds and increasing poor underdrainage. A man well trained in soil physics and the necessary laboratory space should be provided for the study of this problem.

3. Soil Survey. The new positions planned are:

Two men for the field and laboratory study of soil correlation problems, one for the northern and one for the southern part of the state. The reason for these positions is that the validity of detailed mapping depends on the correct identification and correlation of soil types. This phase of the work has not been developed as much as it should have been with the result that the detailed mapping has proceeded without adequate guidance.

One full-time and four half-time party members. The full-time men provide staff stability and the part-time men develop for replacements.

One full-time physical laboratory and one full-time chemical laboratory man. These men are necessary to provide the data upon which correlations are in part based.

One full-time cartographic draftsman. The drafting of soil maps requires a high order of drafting skill and also specialized skill which comes only with experience. Experience has shown that getting the ink work done by bid is expensive and the results unsatisfactory. The hiring of architectural engineering students is more satisfactory; however, the lack of continuity of service associated with their employment and therefore the necessity of training new men frequently results in work of varying quality.

The overall justification for the above positions is that the increasing demands for soil maps makes it imperative that a reasonable acreage be mapped each year if the State Soil Survey is to survive. The expansion planned provides for a survey staff considerably smaller than that formerly employed.

Future Development. Experience indicates that the need for soil information will increase rather than decrease. A reasonably stable, carefully chosen, well trained staff is essential because of the exacting nature of the work. Plans for the future must provide for such a staff if the University is to meet its responsibilities in this field and maintain its position of leadership.

4. Soil Experiment Fields. This division is not planning any post-war activities that will call for expanded building space. Our expansion will go in the direction of additional field experiments over the state. The need for such expansion will not probably call for more than one additional staff member.

5. Soil Biology. In order to function to the best ability an increase in the present staff in Soil Biology is essential. In the post-war period one full-time man for greenhouse and field work should be hired. He would do the actual work involved in rotation and nitrogen-addition studies. This work would be invaluable from the standpoint of future nitrogen additions.

One half-time assistant for greenhouse and laboratory research on the development of and increasing the efficiency of legume nodule bacteria cultures.

One half-time assistant for laboratory control and research, including transferring legume nodule bacteria, making cultures of specialized organisms for other divisions of this department and other agencies, and to assist present staff in controlling present commercial inoculants and research projects.

One half-time clerk for making computations in chemical and bacteriological analyses.

6. Crop Production. Investigations in the field of crop adaptation will probably increase. The development of new crop strains by the method of hybridization is just getting under way nicely. The future appears to point to a great expansion in this work. This will make necessary an enlarged program of crop testing which will yield information on the value and special adaptation of these new varieties in Illinois.

To take care of this greater program of work, three new full-time staff members and one additional half-time assistant will be needed.

7. Plant Breeding. Plant breeding is a local problem and the work must be carried on under the soil and climatic conditions of the region where the improved strains will be grown. Since conditions in Illinois vary greatly from north to south, a minimum of two plant breeding substations are needed, one located in northern Illinois and one in southern Illinois. To man these stations adequately, there are needed at each station a superintendent, a technical plant breeder, and farm labor sufficient to handle extensive plantings of corn, soybeans, small grains, small-seeded legumes, grasses, and new crops.

To make effective progress on a plant breeding program for Illinois, there are needed at the main station (central Illinois), three additional project leaders and a technical assistant for each of the crops listed above. On account of the importance of the corn crop in Illinois, at least two such assistants are needed to work on corn.

IV. PROPOSED NEW SPACE

If the Agronomy Department is housed in a new laboratory building, vacating its present quarters in the Old Agricultural Building, all the space in the new building will be "new" so far as Agronomy is concerned. However, it is assumed that what is meant is additional space requested or

proposed to take care of anticipated expansion in the post-war and future periods. A study of departmental building needs just completed has resulted in the following comparative figures for net floor space and greenhouse space, not including lecture and general classrooms.

	Present	Proposed	Increase	Increase
Net floor	32,850 sq.ft.	45,578 sq.ft.	12,728 sq.ft.	39%
Greenhouse	6,000	8,640	2,640	44%
TOTAL	38,850 sq.ft.	54,218 sq.ft.	15,368 sq.ft.	40%

The additional net floor space requested is designed:

1. To accommodate increased research staff.

2. To replace obsolete with modern research facilities in soil chemistry and plant nutrition.

3. To house modern new equipment or equipment transferred from the Chemistry Department (X-ray), including spectograph, electron microscope, etc.

4. Drying room for plant samples coming in for analysis - long needed but not now available.

5. Constant temperature-humidity room for several types of research with soils, colloids, plant materials, etc. - long needed but not now available in the laboratories.

6. To provide vibrationless mounting for various types of equipment or hand or to be provided, including centrifuges, shakers, grinding machinery, analytical (especially micro) balance, spectograph, etc.

7. To provide modern facilities for teaching.

8. To provide space for statistical calculations where calculating machines are available at all times and do not have to be carried from vault to offices and back again.

9. To provide space for graduate students to work and keep their material.

As will be noted from the above statements an important consideration is modernization in facilities and equipment. A grouping of certain laboratory facilities and a separation of others are essential for efficiency and improved techniques.

A detailed statement giving present and requested not floor space by divisions is available and will be furnished if desired.

V. FUTURE DEVELOPMENT

Most of the plans proposed and explained under Post-war Plans will continue into the future. If we assume that the post-war period will last as long as 10 years after the close of the war, the proposals made will suffice so far as we can anticipate future needs at this time. It is believed that certain readjustments and possible but not certain additions may be necessary beyond the 10-year period. It is certain that the demand for knowledge will be strong and that the University must continue to maintain a vigorous, adaptable, and expanding research program.

V. SUMMARY

The present resident teaching of the department is not heavy and can be handled adequately even allowing for some increases above the peak enrollment reached in 1940-41. However, if short courses and extension courses are added, and there occurs a marked increase in graduate students, certain additions to the staff may be required along with certain space additions. In the main, our present problem is not so much sufficient instructional staff as sufficient and adequately equipped classroom space.

Agronomy is primarily a research department and hence there is need for laboratory space. Much of the data are obtainable from field experiments conducted at various locations in the state. For the soil survey

it might be said that the state is its laboratory. All the divisions of the department gather and use data obtained from stations or plots located in different parts of the state. The extent of the research work of the department, therefore, is not indicated by the amount of floor space actually in use on the campus. This is particularly true of the Soil Experiment Fields division.

Too much stress cannot be put on importance of greenhouse facilities in connection with our research work. The use of a greenhouse which is well proportioned, arranged, and located, can shorten the time necessary for development of improved strains of crops through breeding. It also serves as a miniature field for experiments on seed treatment, effectiveness of legume inoculants, application of fertilizers to different soil types, and the like. We are, therefore, requesting an increase in space of 44 percent over the present greenhouse space. Present space, 6,000 sq. ft.; requested, 8,640 sq. ft. (Project Ag. 10)

The present net floor space occupied by the department is 32,850 sq. ft. The requested space amounts to 45,578, and increase of 39 percent.

To meet increased demands which will most certainly be placed on the staff during the post-war period and beyond, we are requesting and have outlined needs for 28 full-time and 9 half-time additional staff members. It is thought these additions would be made over a period of 10 to 20 years.

Much of the research work of the department is concerned with long-time projects. Examples are rotation systems, fertilizer experiments, and improvement of crops by breeding. New problems are continually arising

and certain shifts in man power and funds must be made at times to center attention on those projects which appear most important and reduce emphasis on those that seem less important. New diseases of crops and new insect pests arise the longer our crops are grown necessitating constant vigilance and diligence on the part of the pathologist and entomologist to keep them under control. Hence, many projects must obviously be indefinite as to length of time and termination.

Finally, the department is finding it increasingly difficult to meet the demands of the farming public for information. Numerous questions are raised to which we do not have the answers. This pressure will no doubt continue and grow more intense. Increases in staff and research facilities are required if the department is to maintain its leadership in the soils and crops research.

Prepared by College Committee on Buildings.

PROJECT AG. 3c

ALTERATIONS IN HORTICULTURAL AND FLORICULTURE BUILDINGS

I. HORTICULTURAL FIELD LABORATORY

The use now made of the Horticultural Field Laboratory is quite different from the original plan at the time it was first occupied in 1923. At that time the building was set up as the main headquarters for teaching and research work on the South Farm. The building then was not equipped for the specialized type of research under way in the Department at the present time. The following analysis of the changes is based upon the present needs of the Divisions of Pomology, Pathology, and Vegetable Crops, all of which occupy a part of the building.

The plans which have been discussed during the present winter months include some changes in the space occupied by the Division of Plant Pathology to make room for three specialized laboratories in what is now room 113. The division would also be assigned rooms 8 and 9 in the basement, and possibly room 7 in which would be placed the air-conditioning equipment for the clavacin research now under way. This plan calls for cutting a stairway into the basement from the front hall in order to make the basement space more accessible. When this is done, the east wing of the building, now room 101, can be changed to meet the more specialized research in the physiological and chemical laboratory and also possibly the fruit products laboratory. These changes are in prospect and much depends upon the type of equipment which will be needed or can be obtained for these specialized studies.

As a result of the changes proposed to accomodate the work of the Division of Plant Pathology it is proposed to put the rough field work of the Division of Vegetable Crops in room 111 and in the basement, room 6 immediately below.

As a result of these changes it is proposed to move the present cider and washing equipment in room 111 to room 108 in the southwest wing.

Tentative plans have been made by the Physical Plant Department under date of December 3, 1943 for a part of the changes which will involve putting in partitions, fixing up the floors and also the installation of ceilings in some of the rooms. If the building is used in this way, the factory type of window which was installed when the building was built will have to be changed over to the modern windows as has been done in the front part of the building. In all there are 41 windows involved in these changes which would be necessary in order for the building to be heated properly. Considerable thought and discussion have been given to these plans and an attempt has been made to make the building adaptable to the research of the divisions concerned and also to put some of the specialized lines of study such as the virus diseases in specialized individual laboratories. The frontpart of the building will be used for the offices of that part of the teaching and research staff quartered at the laboratory as at present.

1. Heating Capacity. The two boilers installed at the Horticultural Field Laboratory were sufficient to take care of the entire building the way it was used. In the proposed development it is quite probable that the present heating capacity of these boilers would have to be supplemented. After the proposed changes in the windows are made, the situation will be helped somewhat but it would be impossible to extend the laboratory area in the building without giving some attention to the heating. The research greenhouse at the Horticultural Field Laboratory is heated from the same system as the building and the capacity of the boilers is taxed severely during the low temperature extremes.

2. Storage Machinery. The cooling system in the storages has been in operation since the building was first occupied. It is probable that within the next few years attention will have to be given to a renewal of the cooling system. If this is done, it is proposed to make provision to cool at least two of the smaller rooms in the building with small, separate cooling units so that these could be operated independently of the general storage. This would make it possible to have temperature rooms available for research during the summer months without going to the expense of running the general system which is needed primarily in late summer and fall when the stored fruit is at a maximum.

It would be difficult to estimate the cost of the changes suggested without a careful analysis of the details of construction, the moving of equipment, the installation of old equipment and certain items of new equipment which are needed. A rough estimate of the changes suggested in including any supplement to the present heating system would probably cost in the neighborhood of twenty-five to thirty thousand dollars.

II. FLORICULTURAL BUILDING

The following changes should be made at the Floricultural Building in order to make provision for the work as it has now developed.

1. Potting Room and Propagating House. We suggest that the east half of the second greenhouse to the west of the corridor be transformed into a potting room. This can be done by removing the glass roof and substituting an opaque roof which will both keep out the sun and shed the water. In doing this, we can maintain a row of ventilators on each side of the ridge which will serve not only for skylight, but also be changed to ventilating sash, so that they may be opened for good circulation. Doors should also

be cut into the side walls, so that we can have an entrance through from the courts for bringing in soil and other materials and taking out refuse. It will also be necessary to change the heating coils and to put in a continuous cement floor. It will probably be necessary in making this transition to put in an iron frame roof structure. Such a potting room would be ideal, as it is closer to the other greenhouses, will keep dirt out of the service building, and will also give sufficient storage room for pots and tools which must now be carried up and down from the basement. If the east half of this house is changed into a potting room, the west half would make an excellent propagating house. The changes suggested here would be the installation of side ventilation and a partition running through the house east and west. This would give us two units for varied types of work. It would also mean the reconstruction of our benches and the re-piping of the house. Such changes as I have suggested will possibly cost around $4,000.00.

2. Laboratory and Storeroom. Having thus removed the potting work from the service building, I would suggest that the tables and equipment of the west laboratory be moved to the east laboratory and the west laboratory partitioned off so as to have two rooms instead of one. This would be done by means of a partition running through the center of the room, north and south, and one across the north part of the east half, so as to make a narrow hallway between this particular room and our present salesroom. From this hallway doors would lead into the west half, the east half and into our present salesroom. The west half would then be used for our flower decorative work which is at present carried on in the little room in the northwest corner of the building. This laboratory should be equipped with individual work tables. The east half, which will be the smaller of the two,

will give us an excellent storeroom. At the present time we have no place except the basement in which to store boxes and other light materials. With the flooding of the basement three or four times a year and the poor ventilation, there is considerable damage done to materials stored. In order to have this storeroom serviceable, it will require some cases and shelving. My estimates for these changes are:

Remodeling and redecorating $1,200.00

Furnishing 1,500.00

3. New Greenhouses. As the plans suggested will call for the elimination of one of our growing houses, we suggest the addition of one or two houses to the south in its place. My estimate for a single house would be about $8,000.00 or almost double that for two houses. These are to be of iron frame construction. (Project Ag. 11)

4. Hotbeds and Cold Frames. In the courts between the greenhouses we have had, in the past, four hotbed frames, each 100 feet long, with seventy-five feet of each steam heated. These were originally built of two-inch Pecky Cypress. Two of these frames were destroyed in 1934 when the Physical Plant Department put the high pressure steam line in for the hospital. The other two are completely worn out and in need of being rebuilt. When putting these frames back and in condition, we suggest that they be built of concrete, so that they will be permanent. Some new sash would also be required. I believe that this could be done for about $2500.00.

III. VEGETABLE GREENHOUSE

The Vegetable Greenhouse building is occupied by the Division of Vegetable Crops and the Division of Plant Breeding. The space in this building is worked to the limit and it is proposed to utilize the basement rooms more effectively as soon as provision can be made to definitely prevent

the flooding of the basement rooms during excessive rain storms. It is probable that the equipment of these basement rooms could be completed, since the heating and lighting is taken care of, by the expenditure of an additional $1500.00. If the changes suggested at the Horticultural Field Laboratory are made, the crowded condition in this building will be relieved somewhat.

Work Room. In the revision of the first-floor rooms in the Vegetable Greenhouse building two years ago the work room to the west of the central passage (Room 107) was converted to a classroom. Provision should be made to replace this working space by adding a unit comparable to the one proposed in Floriculture with suitable basement storage space, work benches, soil bins, tool cases, etcetera. The width should correspond to the greenhouse opposite and the length should be suitable for Horticulture 1 class use for a part of the year. Estimated cost: $4000.00.

IV. NEW SPACE FOR THE DEPARTMENT OF HORTICULTURE

In taking the long look at the needs of the Department of Horticulture the following points should be taken into consideration. First, it is proposed to base the teaching in the Department on the main campus rather than in the outlying buildings such as the Horticultural Field Laboratory. Second, if and when Goodwin Avenue is extended, the present Floricultural building and the Vegetable Crops building as well will have to be abandoned. Third, in view of these two moves in prospect provision should be made in the proposed laboratory building of the College of Agriculture to take up the slack and bring the Department of Horticulture in closer contact with the other plant sciences in the College. If this were done, the needs of the Department would have to be studied in detail at that time in order to

make provision for both the teaching and research in certain lines. As this problem has been studied this winter by the Divisions of Pomology and Pathology, the following laboratory and classroom space would be required.

1. Laboratories for Horticulture 1a: Two laboratories, each with about 1,200 sq. ft. floor space, equipped with desks (botanical type) providing services such as gas, water and electrical outlets, and with blackboards and equipment cases. Student capacity of each laboratory - 36.

2. Laboratories for advanced undergraduates: Two laboratories, each with about 1200 sq. ft. floor space, equipped similarly to Horticulture 1 laboratories. Student capacity - 24. To be used for Horticulture 2, 3, 8, 12, 22, 33, 51, and 55; one laboratory, 1200 sq. ft. floor space, equipped with desks (chemical type) providing services such as gas, water, air, vacuum and electrical outlets, and with balckboards and equipment cases. Student capacity is 24-30. To be used for Horticulture 7.

3. Special equipment laboratory, 250 sq. ft., connecting with laboratories for advanced undergraduates.

4. Equipment and materials storeroom 200 sq. ft. Possibly, should be 2 rooms, each 100 sq. ft., one in connection with Horticulture 1 laboratories, and the other with advanced laboratories.

5. Office space, 250 sq. ft. Providing headquarters in the building for instructors who have their individual offices at Horticultural Field Laboratory. To be used for student consultation, etcetera, in connection with teaching.

6. Lecture room, near laboratories. Seating capacity: 40.

7. Cold storage space for plant material, etcetera, for class use. About 300 sq. ft., probably in smaller units, including one providing low temperatures for quick freezing.

8. Greenhouse, for undergraduate pomology, including service space, 1000 sq. ft.

9. Four research laboratories for staff members, 15 x 20-24 ft., with chemical desks, air pressure, steam, gas, electricity, etcetera.

10. Four offices adjoining research laboratories (above), 12 x 12 ft.

11. One office 15 x 20 ft. for general office.

12. One general laboratory with equipment for chemical or cultural work for graduate research students and staff members, 24 x 20-24 ft., with air pressure, steam and chemical desks.

13. One preparation room for preparation and sterilization of media equipped with autoclave, hot air and steam sterilizers, 15 x 20 ft. (Not to be confused with sterilizing room below.)

14. One inoculating room, air-tight, but ventilated under controlled conditions, equipped with sterilizing mercury vapor lamps, 8 x 12 ft.

15. One glassware and chemical storeroom, 12 x 20 ft., with shelving.

16. One greenhouse, with adjoining service house.

17. One room equipped with large pressure cooker (autoclave) for sterilizing large quantities of media or soil with cart and track. Steam pressure lines. (This should be in basement near entrance to greenhouse and might be shared with other departments.)

18. One air-conditioned culture room equipped to control <u>temperature</u> and <u>humidity</u> at suitable ranges (65-90° F. and 20-60% relative humidity), 12 x 20 ft.

19. One cold storage room, 12 x 12 ft. (This might well be a part of a large unit, consisting of several small rooms for other departments and other members of our own department. Our general laboratory should be equipped with at least 2 modern refrigerators as well as incubators, etcetera.

20. One file room for records, notes, bulletins, books, etcetera, 15 x 20 ft., with stacks and file cabinets.

21. One assembly room for staff and committee meetings, seminars, etcetera, 20 x 24 ft. (may be shared with other divisions of department).

22. If the Division of Plant Pathology is moved to the proposed laboratory building of the College, the Division of Plant Breeding would then be moved to the Horticultural Field Laboratory in the space thus vacated.

23. The Floricultural Division should continue to be housed in a unit contiguous with its greenhouse space in a wing of the new laboratory unit in space built around the functional needs of the Division.

Prepared by College Committee on Buildings.

PROJECT AG. 3d

NEW SPACE FOR DEPARTMENT OF FORESTRY

I. DEPARTMENT LOAD

The department is new and since its establishment has not operated as a fully organized department under peacetime conditions.

If history repeats itself many veterans will seek admission to pre-forestry and forestry curricula in order to prepare for an out-of-door profession. Forty or more students might be enrolled in the pre-forestry curriculum at Illinois. The normal teaching load is probably 20-30 students in the general forestry course, which is required of pre-forestry students and is open to others.

With three million acres of timberland to put under management and three million acres of open land requiring reforestation, those who are being trained to assist land owners and those who will return to farms need at least one course dealing with the application of forestry principles to Illinois land problems. A farm forestry course for prospective farm advisers, vocational agriculture teachers, soil conservationists, and students of general agriculture has been prepared to fill this need when the war ends. (Registration in this course should average 30-40 students).

Research in forestry (the experiment station activity of the department) is basic to development and economic use of some six million acres of Illinois land. The organization of the minimum research program now authorized requires laboratory and greenhouse space and equipment which has not yet been made available.

Extension Service activities may expand but will probably require only one additional office.

II. PRESENT SPACE

Six offices, approximately 1260 sq. ft. (215, 216, 217, 219, 220, and 222 New Agriculture) now in excellent condition.

Laboratory space: Seven hundred square feet have been assigned on the fourth floor of the New Agriculture (406 and 408) but this space is unfinished and is wholly inadequate as to size and facilities for estimated post-war needs.

Storage space: Approximately 200 square feet (410 New Agriculture) are available.

Greenhouse space: None provided at present.

If total space requirement is provided in one unit as recommended, all space listed above will be released.

III. POST-WAR DEVELOPMENT

After the war one new research position on the experiment station staff will be needed to conduct investigations on the utilization of Illinois forest products. One teaching assistant will be needed also. Office and laboratory space will be required for these men. These are not new needs arising in the postwar period, but are normal activities which the new department was developing when the war intervened.

IV. PROPOSED NEW SPACE

The space and facilities required can probably best be provided in a unit or wing of a new building in conjunction with similar space for other departments. The close association of all phases of the department's activity seems desirable. Such a program would release all of the space now occupied by the department when adequate facilities have been provided elsewhere. The total specific needs are:

1. Staff office space - 8 offices (1680 square feet)

2. Laboratory facilities - Research laboratory - at least 2000 square feet of floor space in one large or two small laboratories, with additional space for storage of equipment (gas, air pressure, vacuum, and distilled water services desired); teaching laboratory - at least 2500 square feet of floor space with (a) wall space for permanent exhibits of wood specimens, twig, and leaf collections, tree photographs, and charts; (b) exhibit cases for seed collections, seeding mounts, wood products, foresters' tools and instruments, and storage space for specimens for class use (to accommodate 20-30 students). This laboratory would be used in the general forestry and farm forestry courses.

Research greenhouse: Two small greenhouse sections and head house space (it is necessary to have moderate and low temperature sections for forest tree investigations).

4. Storage for field equipment - 500 square feet of floor space are required for storage of field equipment. (Should be adjacent to laboratory and offices).

5. Class room accommodations (estimated 30-40 students).

This space is needed primarily to provide adequately for present work which was planned before the war. Several phases of this work did not get under way simply because space and facilities were not available.

V. FUTURE DEVELOPMENTS

The department does not desire to propose future developments beyond the immediate post-war period at this time.

VI. SUMMARY

Normal development of the present activities of this relatively new department requires space which can probably best be provided in conjunction with similar facilities for other departments in a new building. If such space is made available, present quarters, largely staff offices, can be released by the department.

Although laboratory and greenhouse space are essential to the present program they were not available prior to the war and the unfinished laboratory space assigned recently will be inadequate after the war.

Prepared by College Committee on Buildings

PROJECT AG. 4

MEATS LABORATORY

I. DEPARTMENT LOAD

For the past several years before our entrance into the war, we have had an average of 90 students in Animal Husbandry 36, our elementary course in meats. Usually 12 to 15 of the enrollment consists of Home Economics girls. The registration in Animal Husbandry 10, the course in slaughtering, cutting and processing, has necessarily been limited to 12 students because of space limitations. In order to handle this many students, it has been necessary to divide them into two sections. Animal Husbandry 24, the course in meat judging, has been limited to 8 students because of lack of adequate facilities. It is quite probable that the post war period will bring us additional numbers of students in meats. With the growing importance of the freezer locker business, it appears that it will be necessary to add at least one course on this subject. Much research has been conducted by the Meats Division and the Meats Division has assisted other divisions of the Department, as well as other departments of the University in their research problems. Physiological chemistry, physiology, zoology, animal pathology, home economics and others call upon us to slaughter animals or to provide material for their research and class work. In 1943, the Division slaughtered 109 cattle, 61 hogs, 90 sheep, 921 chickens, 24 rabbits, 1 veal calf and 6 goats, in connection with the research and class work of the Meats Division and other divisions and departments.

II. PRESENT SPACE

Our total floor area is 3900 square feet, including a small slaughter house, 375 square feet, which is located in the Stock Judging Pavilion. The slaughter house was never built for this purpose, has no

refrigeration, and few conveniences. It also is unsanitary. It is entirely inadequate for our needs. We have occupied it for 20 years.

The remainder of our space is on the first floor of the north wing of the Old Agricultural Building. This was taken over about 20 years ago when the Dairy Creamery moved out of the building. Aside from the lack of space, the most objectionable feature of the laboratory is the fact that it is disconnected from the slaughter house. The classroom, while large enough, is not amphitheater style and the students in the back rows are unable to see the many demonstrations which are a part of our class work. It is my understanding that this space will be assigned to the Chemistry Department for much needed expansion as soon as it is vacated by us.

III. POST-WAR DEVELOPMENT

As noted above, it is quite likely that we will have many more students, both undergraduate and graduate, after the war. Also it is quite likely that the demand for research will be increased. There have been many developments recently, such as freezing, dehydration, stabilization of fats, and the effect of different methods of feeding and management on the quality of the meat. On these and many other problems further research is required. In normal times the Meats staff consists of one assistant and the Head of the Division. At the present time, we have no assistant. When we get back to normal times, it will be necessary to have at least one full-time assistant.

IV. PROPOSED NEW SPACE

The Physical Plant Department of the University prepared blueprints for a new meat laboratory in 1937. These plans, with a few changes, meet with our approval. They provide for 12,000 square feet of floor area. About 2,200 square feet (the abattoir) should be of factory construction. Gas, high

pressure steam and electricity for motors will be essential. Refrigerators will require about 1,050 square feet and sharp freezers about 260 square feet, the lecture room 1,150 square feet and the cutting laboratory 18,000 square feet. The last two will require air conditioning since it is almost impossible to work with meats, either experimentally or in the classroom at the room temperatures which we have for six months of the year. Our preference as to the location of the Meats Laboratory, is immediately to the east of the Stock Judging Pavilion. This is for three reasons: (1) The proposed holding stalls and scales at the Stock Pavilion will also serve for the needs of the Meats Division; (2) Instructors in judging of meat animals often wish to have the students judge the animals on foot and later judge the carcasses; and (3) we have several meetings of cattle feeders, hog feeders and lamb feeders at the University each year which require carcass demonstrations. The attendance at these meetings is from 600 to 1200 people. The Stock Pavilion is the only room available which is large enough to care for this many. We hope to have a covered runway connecting the Meats Laboratory with the Stock Pavilion with over-head rails so the carcasses may be run directly from the refrigerator in the Meat Laboratory into the Stock Pavilion.

V. FUTURE DEVELOPMENT

I feel that our building needs as already outlined will take care of the requirements of the Meats Division for many years to come.

VI. SUMMARY

The space occupied at present by the Meats Division is entirely inadequate for both instruction and research because of lack of space and equipment, the separation of the slaughter house from the laboratory and classroom and the fact that the space was never intended for the kind of work for which it is being used. The proposed building will adequately take care of the needs of the Division for many years to come and will release space in the Old Agricultural Building which is badly needed by other departments of the University.

Prepared by College Committee on Buildings.

PROJECT AG. 5

AGRICULTURAL ENGINEERING BUILDING

I. DEPARTMENT LOAD

Agricultural Engineering had a total student enrollment of 534 in 1941-42 courses. One course, Agricultural Engineering 1, had 259 students. There are 17 courses offered by the department. About 50 students were enrolled in the curricula leading to a degree in agricultural engineering. In 1941-42, the staff consisted of 14 full-time members and 4 other full-time employees.

There has always been a rather high enrollment in agricultural engineering courses; however, the advances in soil conservation, the renewed interest in drainage, the extension of rural electric lines, the mechanization of agriculture, and the increased interest in farm structures have led to the addition of new courses in the last 15 years, the establishment of degree curricula, and graduate work. There has also been a tremendous increase in conferences and in group meetings relating to agricultural engineering. Meetings, with attendance frequently exceeding 200 persons, are held each year for conferences, short training courses, and aid to vocational teachers and representatives of industries.

Research programs represent the greatest increase in the departmental activities. Research projects with headquarters in agricultural engineering include studies in crop drying and dehydration, weed control, utilization of electricity, development of electrical equipment, farm building design, grain and soybean storage, septic tank design, tractor and machine studies, and organization and operations in power farming.

II. PRESENT SPACE

The Department of Agricultural Engineering is housed in a square, 3-story wood-framed, temporary-type structure erected in 1905 at a cost of $42,000. The net floor area of approximately 30,000 square feet is built about a central light shaft with inadequate corridors or hallways. The small basement space is dark and unsatisfactory for student lockers and toilets and for laboratory use. It is doubtful if it meets the minimum University standards for such uses. The third story or attic is hot in summer and cold in winter; it is unceiled and has insufficient headroom to be used for any purpose except storage, and the structural condition definitely limits the space for storage purposes. Thus, the ground floor and the second floor are the only areas usable for class, laboratory and research. On these floors, the toilets and storerooms are dark, the entire space is divided at random, for offices and laboratories with no possibility of an effective organized arrangement. There is one small auditorium, capacity 150, and one small classroom, capacity 30, available for classes. The drafting laboratory is limited in capacity to about 25 persons, necessitating small sections. Laboratories for home equipment, farm shops, dehydration, grain testing, weed control and department shops are accommodated by temporary partitions or fenced off spaces in the open area. Office space is inadequate; two men, on leave, had desks in laboratories and four were in one room where one or two draftsmen also work.

The tractor and gas engine laboratory was added in 1922 and furnishes approximately 6,200 square feet of open laboratory space that is reasonably adequate for tractors and power machines. This is a brick structure with steel framework. Subject to certain limitations, the tractor laboratory might be incorporated as a wing of a new structure; however, the saving would probably not justify this procedure.

III. POST-WAR DEVELOPMENTS

Plans for postwar development involve the following probable phases:

a. To provide facilities for students in specialized fields, such as soil conservation and structures, dairy engineering, and household equipment.

b. To meet the increased demand for vocational and short-time training in tractors, machinery, construction and shop methods.

c. To greatly increase the research program to meet the demands for new information.

d. To further develop the graduate work.

e. To increase the extension work to meet the need for technical help in drainage, soil erosion control, structures, rural electrification, and fire and accident prevention.

f. To increase the staff to at least 20 members, the principal increase to be in the fields of extension and research.

IV. PROPOSED NEW SPACE

The net floor area for a new building to accommodate the needs should consist of approximately 50,000 square feet of net area. This would be divided more or less equally between finished space for auditorium, classrooms, offices, drafting laboratories and research area, and less completely finished space for research and student laboratories for mechanical and electrical equipment, household equipment, farm construction, dairy engineering, hydraulics of soil erosion control, field and power machinery, tractors and shops.

The general plan presumes a 3-story main structure starting at the ground level, two attached laboratory wings and an enclosed court, the whole

area covering about one acre of ground space. At least one or two laboratories should be adapted for complete air conditioning and constant humidity for studies relating to seed cleaning and weed control, dehydration, and crop processing. A considerable amount of soundproofing will be needed to insulate against noise from machinery and power activities. A large elevator and special facilities will be needed for loading, unloading, transporting and handling heavy machinery.

New phases of importance that should be accommodated include: Laboratories for building and materials studies, hydraulics of soil conservation, dairy engineering, farm and household utilities, and space for vocational agriculture equipment and model shops.

The type of construction should be comparable to the other south Campus buildings in the 3-story portion. The wings should be of durable but relatively low-cost construction with a minimum of finish and partitions. The location is presumed to be approximately in the same area as the present building.

V. FUTURE DEVELOPMENT

Illinois ranks very high among the states in farm income, use of mechanical equipment, value of buildings per farm and proportion of all farms served by electricity. Its most productive land is in drainage districts where maintenance is an important problem. The value of the land subject to erosion makes soil conservation a dominant need. Illinois also ranks at the top of the list in the manufacture of tractors and farm machinery, and greatly expanded University programs are needed to properly contribute to the development of new and the improvement of old machines,

The increased interest in home refrigeration and food freezing offers an opportunity for definite developments along this line. Rural housing and household utilities have not yet been given the proper attention since needed expenditures for home and farm buildings will aggregate many millions of dollars in the immediate post-war period.

VI. SUMMARY

The Department of Agricultural Engineering activities are now housed in a 38-year-old building of temporary-type construction that is not structurally sound nor adequately arranged for efficient use as a college building.

Since the erection of the building, the Division of Farm Mechanics has been separated from the Department of Agronomy and expanded into a department (1921). From a few courses taught to agricultural students, the department has advanced to a position where degree courses are offered and graduate work is being developed in agricultural engineering.

All of the research activities, which in the future will probably exceed 50 percent of the department's activities, have been added since 1921. Extension work, which is relatively new in agricultural engineering, should be expanded several times over to meet the demand for services.

The new building is proposed to (a) Provide structurally sound building space, (b) Offset the present deficiencies in plan and structure, (c) Meet the greatly expanded developments in agricultural engineering, and (d) Provide facilities for additional activities that appear to be in the making, such as refrigeration, other electrical applications, rural housing improvement, automatic machinery, crop drying, dairy engineering, and the hydraulics of soil and water conservation. The need is for approximately 50,000 square feet of net space.

Prepared by College Committee on Buildings.

PROJECT AG. 6

ADDITIONS TO DAIRY MANUFACTURERS BUILDING FOR DAIRY BACTERIOLOGY AND CHEMISTRY

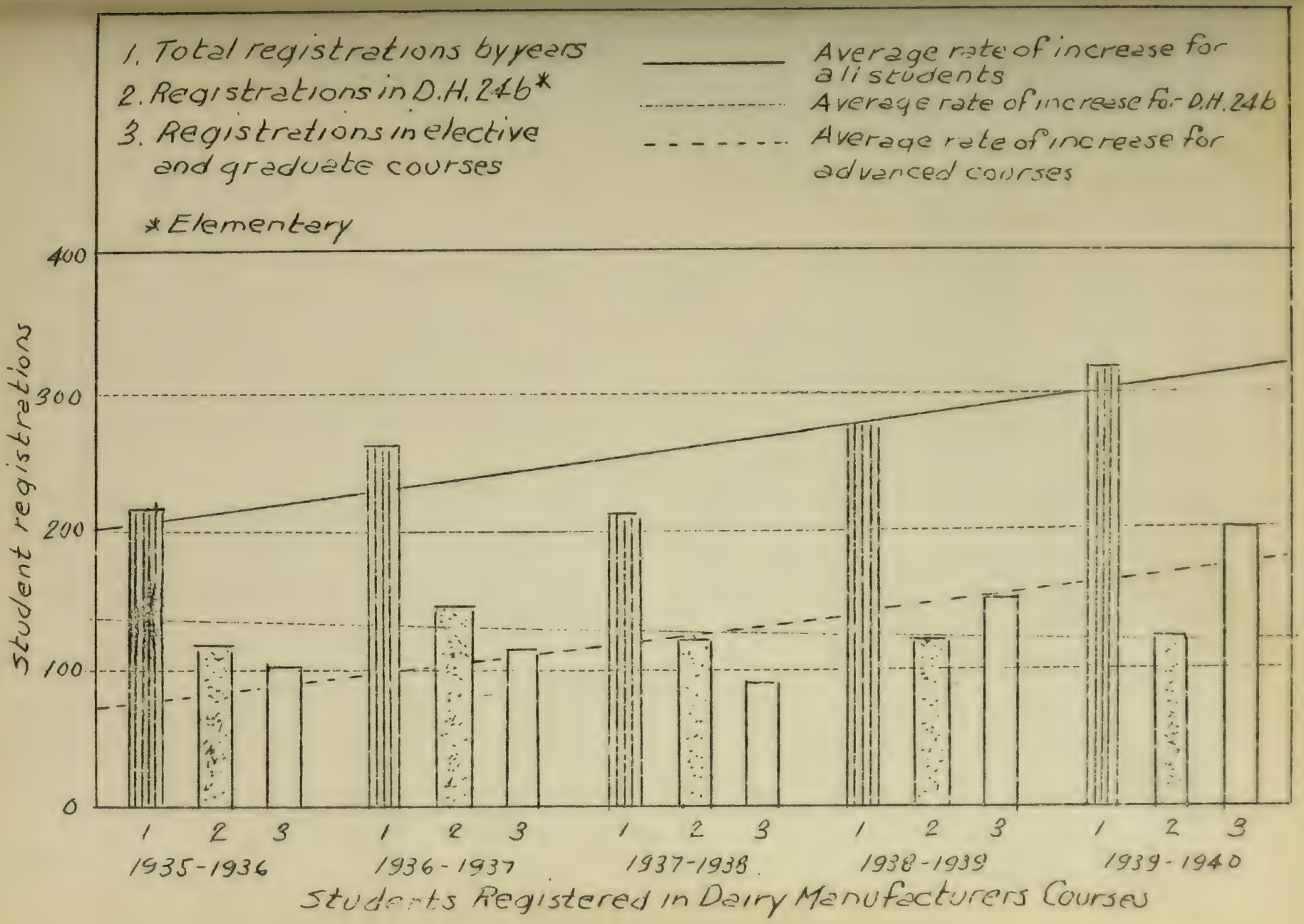
The Department of Dairy Husbandry in making post-war plans in teaching, research, and industrial relations has become acutely conscious of its reduced functional efficiency because of the location and inadequate housing of some of its divisions. There appears to be no practical or economical way of remodeling present facilities to meet the needs of at least two of its divisions, Dairy Bacteriology and Chemistry. These two divisions, to function most effectively, should be closely identified with Dairy Manufactures and, if possible, housed in the same building.

The housing problem of the department is, therefore, one of relocation of Dairy Bacteriology and Chemistry. It is accordingly proposed and recommended that there be constructed a Dairy Industries Building adequate to house all of the divisions and offices of the department.

I. DEPARTMENT LOAD

The accompaning charts indicate the growth in numbers of Dairy Manufacturing and Dairy Production students from 1935 to 1940 inclusive. The normal expected increase in students together with requests coming to the department from men in the armed forces indicate that the teaching load when resumed will require an enlarged staff and more and better physical facilities.

The dairy industry is growing in Illinois and in this central area and the Dairy Department is making plans, especially in its research program, to meet in full its obligation to an expanded industry. Much of the equipment now used in research is antiquated and must be replaced if the department is to attract the best students, especially graduate students, and hold the respect of industry. Members of the department are especially anxious to do both.


1. Total registrations by years
2. Registrations in D.H. 24b*
3. Registrations in elective and graduate courses
* Elementary
Average rate of increase for all students
Average rate of increase for D.H. 24b
Average rate of increase for advanced courses
Student registrations
400
300
200
100
0
1 2 3
1935-1936
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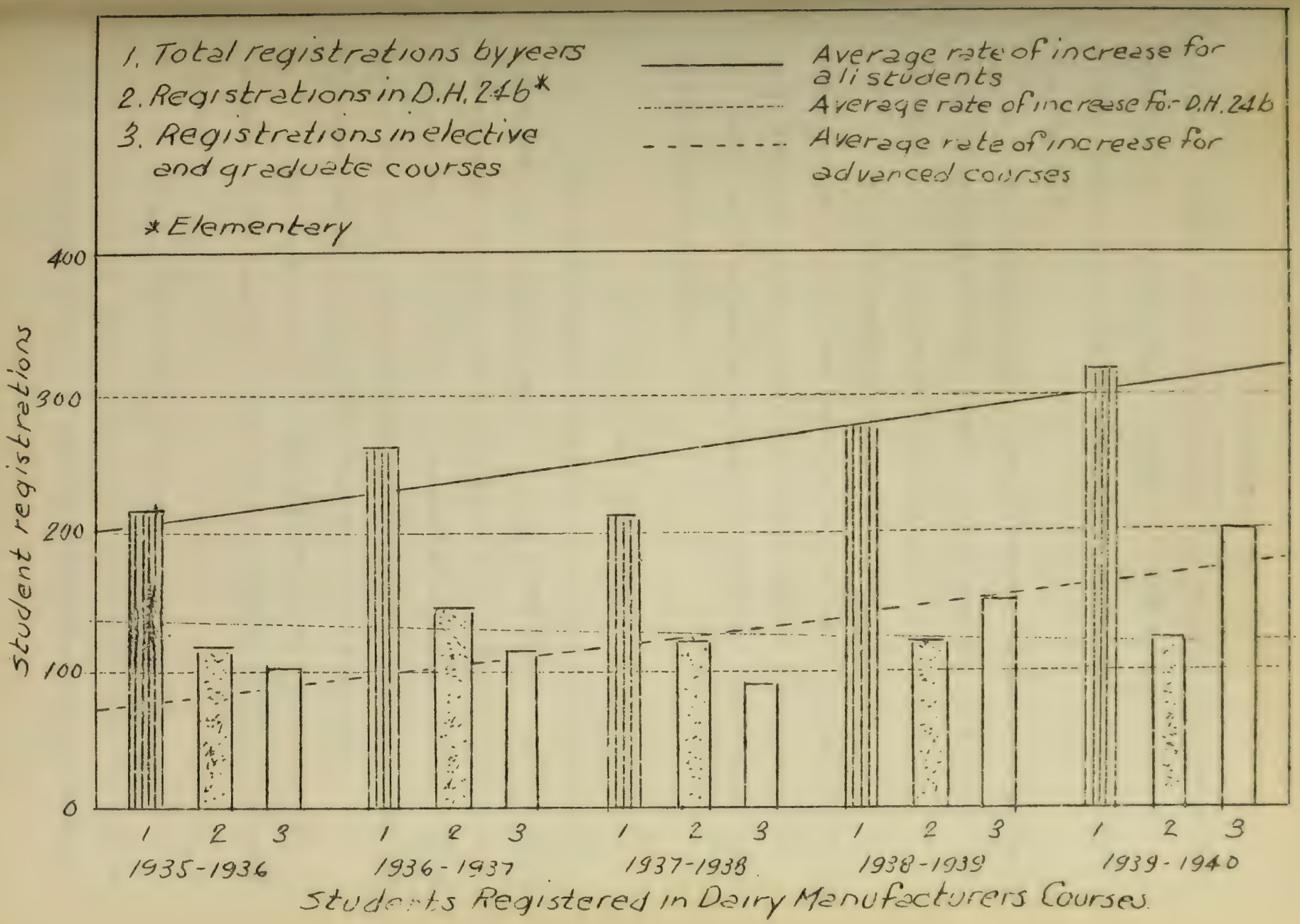
1936-1937
1 2 3
1937-1938
1 2 3
1938-1939
1 2 3
1939-1940
Students Registered in Dairy Manufacturers Courses


1. Total registrations by years
2. Registrations in D.H. 24b*
3. Registrations in elective and graduate courses
* Elementary
Average rate of increase for all students
Average rate of increase for D.H. 24b
Average rate of increase for advanced courses
Student registrations
400
300
200
100
0
1 2 3
1935-1936
1936-1937
1937-1938
1938-1939
1939-1940
Students Registered in Dairy Manufacturers Courses.

II. PRESENT SPACE

A survey of the needs indicate that it requires approximately 30,000 sq. ft. of floor space in addition to that now provided in the present Dairy Manufactures Building to meet the needs of all divisions of the department.

The construction of a Dairy Industries Building using the present Dairy Manufactures Building, remodeled where necessary, as a part of the structure could provide adequate facilities.

This construction would accomplish two objectives. It would bring together all divisions under one roof and avoid duplication of equipment, expensive installations, etc., now necessary. Furthermore, this arrangement would release approximately 8,000 square feet of space in the Old Agriculture Building.

III. POST-WAR DEVELOPMENTS

The dairy industry perhaps more than other food industries is undergoing basic changes. Dehydration may revise certain dairy practices extending even to production on the farm. This tendency to make more complete use of the non fat fraction of milk along with another to reduce butter fat to oil and use the fat in that form for manufacturing purposes indicates clearly the progressive viewpoint of the industry.

The department in its research program must anticipate these changes. In its teaching it must find the facts for presentation to its students.

It is apparent that the department will need to re-establish all positions vacated by staff members now in the armed forces. In addition it is anticipated that four to five new staff members will be required.

IV. PROPOSED NEW SPACE

It is estimated the 30,000 square feet of floor space in addition to that now provided in the present Dairy Manufactures Building is needed. The construction should be thoroughly modern and the design made to anticipate the future needs of the department. The location already determined by the position of the Dairy Manufactures Building would be satisfactory. Special services, such as steam, gas, electricity, etc., are already provided and constant temperature chambers, refrigeration, etc., could be easily adjusted to all of the needs of the department.

V. FUTURE DEVELOPMENT

The efficiency of the dairy cow as a food producing unit and the properties of milk as human food make the dairy industry a permanent industry. The department feels keenly its position in and relation to the industry. Its plans are for service to the industry and for expansion to make this a top rating Dairy Department.

VI. SUMMARY

The department is asking for an appropriation adequate to provide a Dairy Industries Building designed to meet the present and future needs.

One building is suggested because it will insure a more efficient organization and reduce materially the cost of operation.

The erection of such a building will release space equivalent to essentially 8,500 square feet in the Old Agriculture Building.

The teaching and research of the department require this reorganization and expansion.

It is realized that this is a preliminary and an abridged progress report. The department would welcome at an appropriate time an opportunity to present its plans for development in greater detail.

The Dairy Department has been informed that the Department of Animal Husbandry is recommending a remodeling of the Stock Pavilion to include a holding barn for approximately one hundred animals. This department wishes to endorse and support the request of Animal Husbandry since the Dairy Production Division would share in the benefits. Furthermore, many activities of this department and we presume likewise of Animal Husbandry, have been hampered because of a lack of such facilities. The proper demonstration of the results of experiments and any activity involving a considerable number of animals, was almost impossible because of the time element in hauling animals to and from the dairy barn. If they could have been hauled when time and other barn operations permitted and held until used, we could have been much more effective in presenting the results of our experimentation.

Prepared by College Committee on Buildings.

PROJECT AG. 7

COMPLETING PURE BRED DAIRY BARN

Approximately twenty years ago plans were made for the construction of a Pure Bred Dairy Barn. Three of the five units originally planned were constructed. The central section intended to provide facilities for handling milk and including a class room for judging purposes and to accommodate delegations visiting the barn, was not completed. The box stall section badly needed to provide calving quarters was likewise omitted. These units have been redesigned to include new developments and improvement not known when the original plans were made and the department recommends the construction of these newly designed units.

I. DEPARTMENTAL LOAD

Construction recommended at the Pure Bred Dairy Barn is self evident. As a matter of general policy in order to be assured of dairy products of the highest quality to be served at Illini Union and other units of the University, the Dairy Department has undertaken to produce the milk processed and distributed by the University Creamery. The present milk house at that barn is a remodeled structure originally used to house calves at the old barn on the campus, The reason this had to be done was because the central section of the Pure Bred Barn designed for the purpose was never built. The present milk house constructed almost twenty years ago as a temporary building is still in use. The present arrangement is neither economical nor appropriate and this condition should be corrected.

II. PRESENT SPACE

It is not so much a matter of adding new floor space as it is providing proper facilities. The department feels keenly its inability to carry out certain sanitary procedures without an unnecessary amount of extra labor and even then there is doubt as to how effectively these procedures

can be carried on without proper equipment. Breeders and dairymen note these things and draw our attention to this lack of modern housing and equipment.

III. POST-WAR DEVELOPMENTS

Improving the quality of milk and the use of machinery to relieve the drudgery of production are apparent developments at the farm level. Research in management and breeding will be facilitated by this proposed construction. Costs of operation will be reduced by it. The demonstration of the results of research to the visiting public will be greatly facilitated.

IV. PROPOSED NEW SPACE

This proposed construction will require approximately 8,500 square feet of new floor space. Construction should conform in type and material to present construction.

Plans require four temperature controlled box stalls. Special services are already available. Sanitary milking quarters with a capacity for milking 100 cows is included. Sterilizing equipment, walk in cooler and a farm control and testing laboratory are a part of the plan.

V. FUTURE DEVELOPMENT

It is not probable that the dairy herd will be developed beyond its present numerical strength. Improvements will be to improve quality, efficiency, and to develop research and improve teaching technique and material.

VI. SUMMARY

This construction is badly needed. It will improve sanitary conditions, provide a more economical arrangement and facilitate the teaching and research of the production division.

Prepared by College Committee on Buildings.

PROJECT AG. 8

MACHINERY SHED AND FARM SHOP

I. DEPARTMENT LOAD

The "load" which affects the necessity for this building is the 400 acres of land and the number of livestock which must be handled by the Department. Even before the addition of the last 80 acres of land to the farm, facilities for the storage and maintenance of the farm machinery of the Department were inadequate.

II. PRESENT SPACE

The two small frame buildings which house this equipment are 30 and 40 years old and are entirely inadequate for the purpose.

III. POST-WAR DEVELOPMENT

Additional land must be acquired if the Department is to render the service it should to the livestock interests of the state. This will accentuate the need for this structure.

IV. PROPOSED NEW SPACE

The structure should be about 18' x 320' with a second story over 62'. The walls should be masonry to the first floor. Not all of the floor area will need to be concreted.

Prepared by College Committee on Buildings

PROJECT AG. 9

HOLDING BARN

I. DEPARTMENT LOAD

Not a factor in this request.

II. PRESENT SPACE

None. No space is provided for this purpose at present.

III. POST-WAR DEVELOPMENT

With the livestock barns so far away from the Stock Pavilion, space for holding animals at the Pavilion for judging classes, student fairs (such as the Little International), and other similar events is essential to a full use of that building.

Another entirely new factor which gives added responsibility to the University to provide such facilities is a demand made by the Illinois State Livestock Breed Associations for facilities at the University which can be used by these various breed associations in which to hold sales of purebred livestock.

The Department has not been in a position to avail itself fully of this most excellent contact. The public relations value of such facilities would be very great.

IV. PROPOSED NEW SPACE

Approximately 10,000 to 11,000 square feet of floor space, if suitably arranged, would probably be adequate. The structure should be fireproof.

The needed facilities can probably be most cheaply provided if they are incorporated into the Pavilion at the time that repairs to this building, which are now contemplated by the Physical Plant Department, are undertaken.

Prepared by College Committee on Buildings.

PROJECT AG. 10

AGRONOMY GREENHOUSES

See Project Ag. 3b

PROJECT AG. 11

HORTICULTURAL AND FLORICULTURE BUILDINGS

See Project Ag. 3c

SECTION 5

PROJECTS PROPOSED BY DEPARTMENTS IN

THE COLLEGE OF ENGINEERING

SECTION 5

PROJECTS PROPOSED BY DEPARTMENTS IN

THE COLLEGE OF ENGINEERING

GENERAL COMMENTS

The space now available in the buildings devoted to instruction and research in the College of Engineering and the Engineering Experiment Station is inadequate in area for present enrollments and programs and much of the space is unsatisfactory because of age, obsolescence and the changed requirements brought about by the marked developments which have taken place since the buildings were constructed and the major equipment was installed.

The oldest space now occupied by the Electrical Engineering Laboratories was built 47 years ago and the newest, with a very minor exception, 42 years ago. Practically none of it was designed or constructed for its present use. The oldest space now occupied by the Mechanical Engineering Laboratories was built 42 years ago and the newest 28 years ago. The Physics Laboratory was built 35 years ago.

Vast changes have taken place in all of these fields since the laboratories were constructed; the enrollments have increased many fold and the research programs have expanded tremendously in magnitude and scope. The betatron invented and developed in the Physics Department gives promise of being the major development of this decade in the field of physics. This project is now temporarily and inadequately housed.

The buildings and equipment of the College of Engineering have not kept pace with the greatly increased enrollments and research activity, nor with the corresponding facilities provided at neighboring institutions.

Prepared by: M. L. Enger
Dean of the College of Engineering

SUMMARY OF PROJECTS

PROPOSED BY DEPARTMENTS

OF THE

COLLEGE OF ENGINEERING

Number	Name of Department	Net Floor Area		Page
Eng. 1	Electrical Engineering Laboratory	94,800 sq.ft.	(a)	3
Eng. 2	Mechanical Engineering Laboratory	150,000 " "	(a)	20
Eng. 3a	Addition to Physics Laboratory	50,000 " "		38
Eng. 3b	Betatron Laboratory	9,500 " "	(a)	47
Eng. 3c	250-Million-Volt Betatron and Betatron Laboratory Addition	4,640 " "	(b)	53
Eng. 3d	Enlarging Physics Library	-----	(c)	56
Eng. 3e	Repowering Physics Laboratory	-----	(d)	58
Eng. 4a	Mining and Metallurgy Building	38,500 " "		59
Eng. 4b	Foundry Building	5,000 " "		69
Eng. 5	Space for General Engineering Drawing . .	-----	(c)	70
Eng. 6	Aeronautical Engineering Building	50,000 " "		73

(a) Involves expenditures for major equipment
(b) Involves equipment estimated to cost $1,350,000
(c) Reassignment and remodeling present floor space
(d) Only a part of a general university problem. (See Project P.P. 3)

PROJECT ENG. 1

ELECTRICAL ENGINEERING BUILDING

I. INTRODUCTION

For many years the staff members of the Electrical Engineering Department of the University of Illinois have felt themselves handicapped in their work by inadequate, ill-arranged space and equipment for teaching and research. Many studies and suggestions for improvements have been made in the past and many of these have been put into operation in attempts to keep pace with the changing needs of the students and staff in Electrical Engineering. However, there are limitations to improvements while using the present buildings, and in spite of all efforts to maintain high standards of instruction for the students, ground is being lost. The problem is further complicated by the expected increase in enrollment following the war. The object of the present study is to coordinate the individual estimates of the staff regarding future needs in the light of past experience and present circumstances.

The problem of future needs, of course, is difficult to visualize. However, the evidence favors a substantial increase in enrollment beyond any previous number. Following the last war, college enrollments increased to an unprecedented high. The present war is stressing technology as no other war has. This has stimulated public interest in engineering, and will attract additional students to engineering, many of whom now are using engineering products in war. Much equipment which has depreciated or been destroyed in war will have to be repaired or replaced. Industry has been developed greatly and new products will be placed on the market. New

industrial demands for trained engineers should be very great. New fields, related to electronics and radio, such as radar, television, ultra-high frequency, and many others should create demands for electrical engineers beyond all previous demands, since many of them are really developments of the present war. Also, other electrical applications are only awaiting final development work before being placed on the market for the first time. The difficult part of the problem is in estimating the increase in enrollment rather than in determining whether an increase may be expected.

Since it seems certain that the number of electrical engineering students will exceed all previous records, it is important that preparations be made quickly to meet this demand, by providing more adequate space and equipment. The time available is short when measured against the time required to prepare adequately.

Little space is available in the present buildings for research by either students or teaching staff, both of which are vital activities of an engineering college. This must be remedied if the department is to progress as it should.

It should be noted here that the present building is inferior to those of neighboring universities. One has just completed a new engineering building which cost more than the total amount spent for the entire engineering college buildings and equipment at Illinois in its whole history. Others are definitely planning new building programs to go into effect as soon after the war as possible. It would be extremely difficult, if not impossible, to maintain a high standard for the department here in the face of these handicaps.

II. DEPARTMENT LOAD

Below are tabulated some statistics comparing 1929-30, when the last major increase in space was made, and 1941-42, the last year before the war. Also, the tabulation includes the predictions of probable load for the post-war period and the future. The chart in Fig. 1 indicates the predicted growth of the teaching load.

1. Comparison of Load for 1929-30 with that for 1941-42.

	1929-30	1941-42
a. Students (Electrical Engineering)	400	302
b. Student registration	1679	2647
c. Student credit hours	3879	4903
d. Sections	108	175
e. Instructors	13	20
f. Equivalent instructors undergraduate teaching	11.6	17.6
g. Instructor clock hours	175	250
h. Instructor equivalent hours	145	225
i. Load Factor (Bu. Inst. Res.)	2.7	2.43

2. Department Load by Years.

Year	Student Credit Hours	Year	Student Credit Hours
1929-30	3879	1936-37	4071
1930-31	4002	1937-38	4300
1931-32	4582	1938-39	5383
1932-33	4474	1939-40	5525
1933-34	4036	1940-41	5366
1934-35	4029	1941-42	4903
1935-36	4028		

3. Prediction of Future Department Load. Considering the long-time trend shown in Fig. 1, the loads for the school years 1946-47 and 1951-52 would be about as follows:

Year	Student Credit Hours	Year	Student Credit Hours
1946-47	5400	1951-52	5700

For four years after the war the load is expected to be about thirty per cent above normal, as shown by the long-time trend and the Post-War curve on Fig. 1.

	Year	Student Credit Hours
War over in 1946	1946-47	6800

4. General Comments. It will be noticed that the student credit hours showed a decided increase while the enrollment in Electrical Engineering dropped. This was due to a heavy increase in enrollment in service courses, principally in Mechanical and Chemical Engineering. About 50 per cent of the teaching load in 1941-42 was in service courses. The surge in enrollment in Electrical Engineering which ended during the depression was due, mainly, to the rapid development of radio during the preceding decade, and the stimulation of industry resulting from the first World War.

The predicted probable load in the future seems rather conservative. There can be little doubt that student registration in the Department Electrical Engineering will increase markedly when the following influences are considered:

a. Stress on engineering during the war. This will increase the enrollment in all the main branches of engineering, all of which will increase the instructional load in electrical engineering.

b. Stimulation of industry and consequent development of new engineering products. This will increase the demand for engineers.

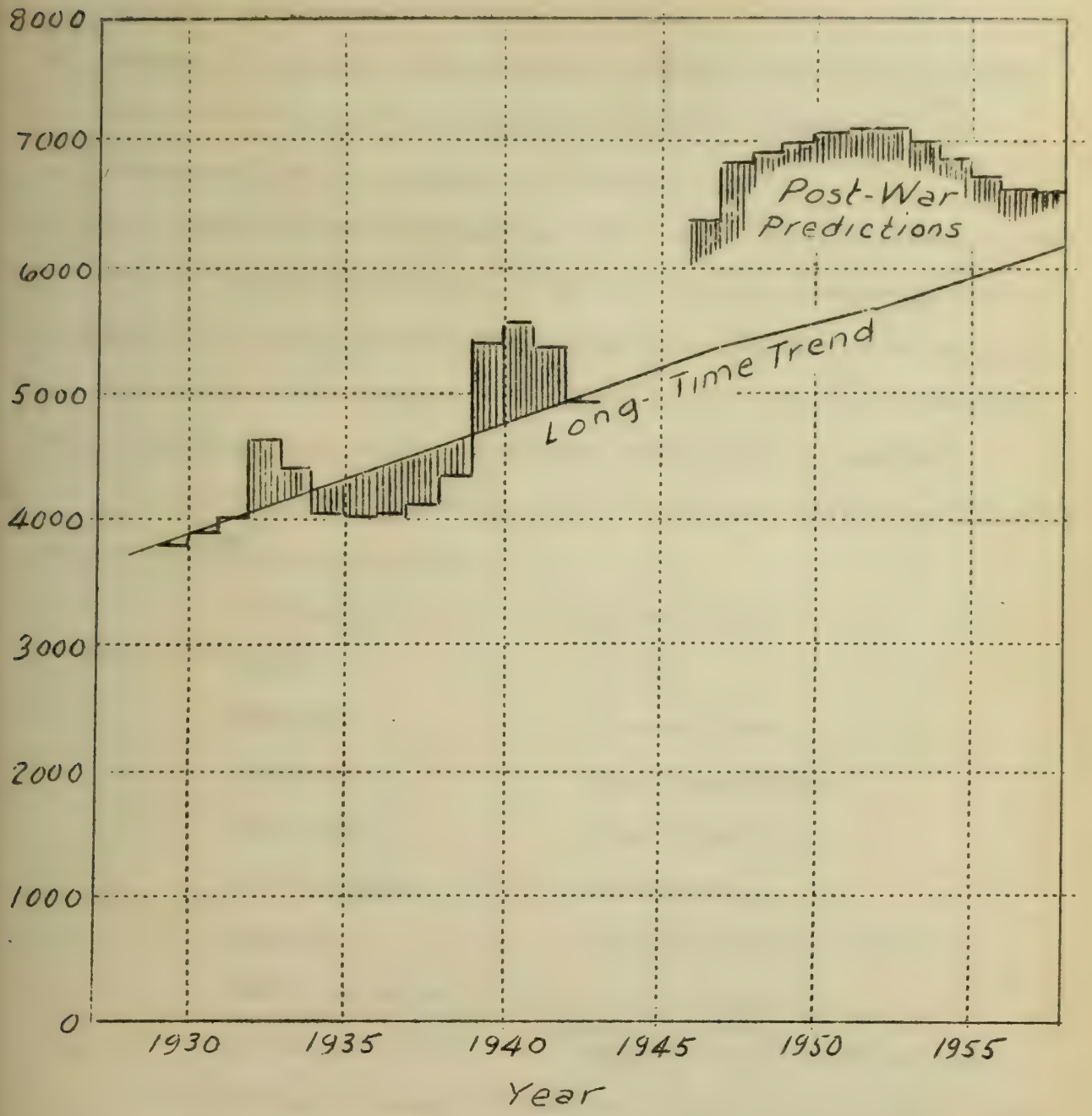
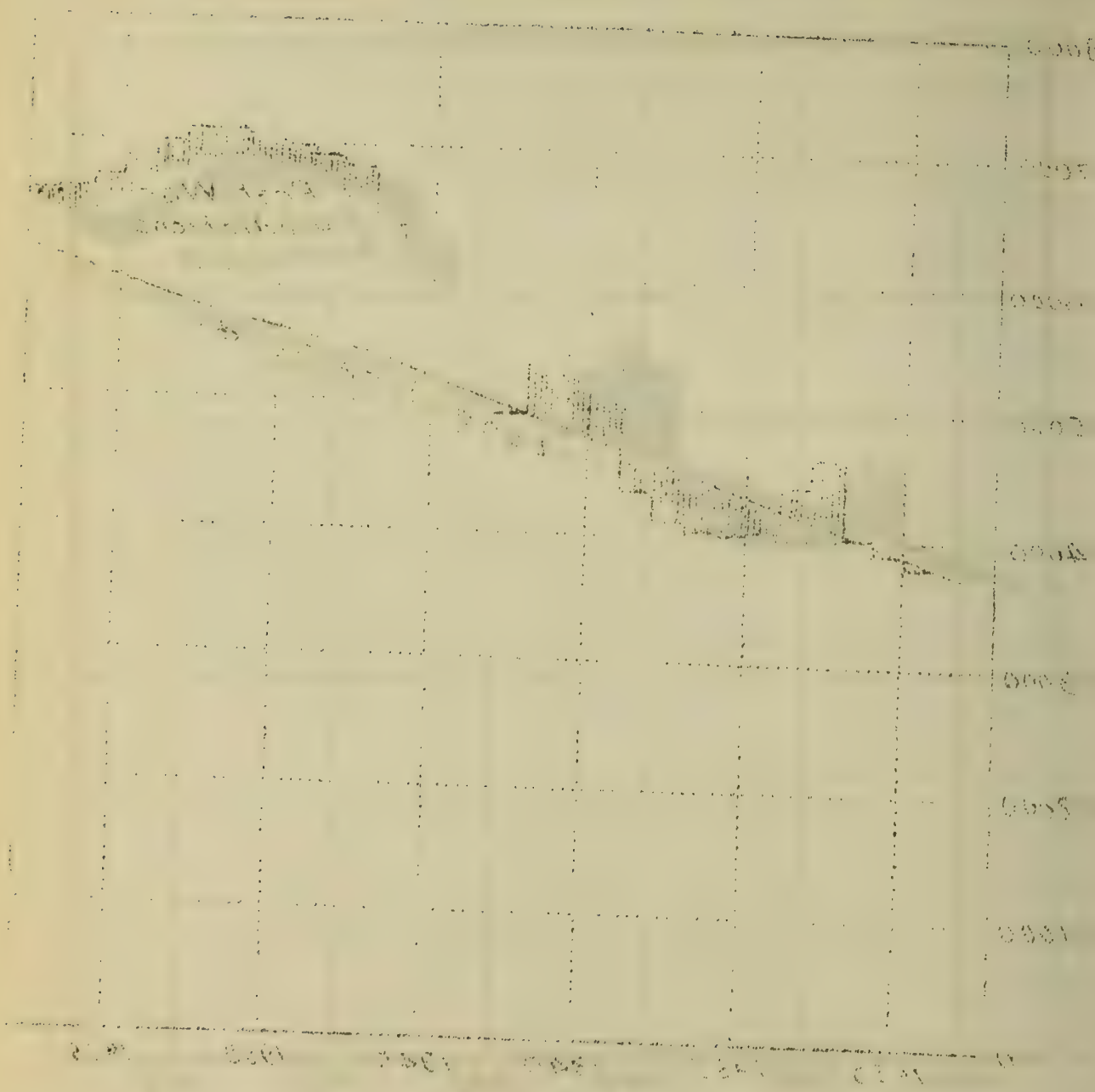


FIG. 1. ACTUAL AND PREDICTED STUDENT CREDIT HOURS



c. Many students and prospective students, whose educational programs have have been interrupted, returning to school.

d. Students who received some technical training in war courses, and who otherwise would never have considered going to college.

e. Governmental aid for returned war veterans.

f. More students going to college than ever before due to long-time trends.

It is expected that the number of instructors needed for the department will increase probably to twenty-eight or thirty during the post-war period with little decrease (perhaps two men) in the years immediately following that period, due to the general upward trend in enrollment.

Recent research activities in the department include the following subjects as well as some others:

Instruments	Illumination
Meters	Paints
Metermen	License plates
Dielectrics	Power transmission
Photocells	Power distribution
Vacuum tubes	Oscillators
Antenna	Short-wave radio transmitters
Cable ionization	Corona discharge
Quartz crystals	Magnetron oscillators and others.

The war has stimulated interest and activity in research as never before. The electrical engineering field extends into all other engineering fields. Some of these are: aeronautics, agricultural engineering, automotive engineering, automatic controls, and mineral prospecting.

In addition to service courses, a part of the outside services performed by the Department of Electrical Engineering are listed below:

Consulting service to the Physical Plant Department

Spectrographic curves and color consulting

Agronomy	Horticulture
Animal Husbandry	University High School
Animal Nutrition	Physical Plant
Ceramics	Soybean Laboratory
Chemistry	Physiology
Home Economics	Regional Soybean
Industrial Interests	Laboratory in Peoria

Calibrating and repairing instruments

Agriculture	Mechanical Engineering
Ceramics	Mining and Metallurgy
Chemistry	Natural History Survey
Civil Engineering	Physics
Geology Survey	Psychology
Home Economics	WILL Radio Station
Theoretical and Applied Mechanics	

III. PRESENT SPACE

The map in Fig. 2 shows the location of the present Electrical Engineering Laboratory, relative to Engineering Hall. Areas are designated by number and referred to in the tabulation below, showing dates acquired by the Electrical Engineering Department:

Area No.	Date Acquired	How Acquired
1	1897	Built for both Electrical Engineering and Mechanical Engineering at the same time with part 2, which was built to house the University Power Plant and the Mechanical Engineering Laboratory.
2	About 1911	Formerly occupied by Mechanical Engineering Laboratory and the University Power Plant.
3	1929	Corridor and 5 rooms erected to connect with old Laboratory of Applied Mechanics.
4	1929	Building formerly occupied by Laboratory of Applied Mechanics.
5	1932	Old boiler room built in 1898, and vacated by the Department of Theoretical and Applied Mechanics and the Physical Plant in 1929 and early 1930's.

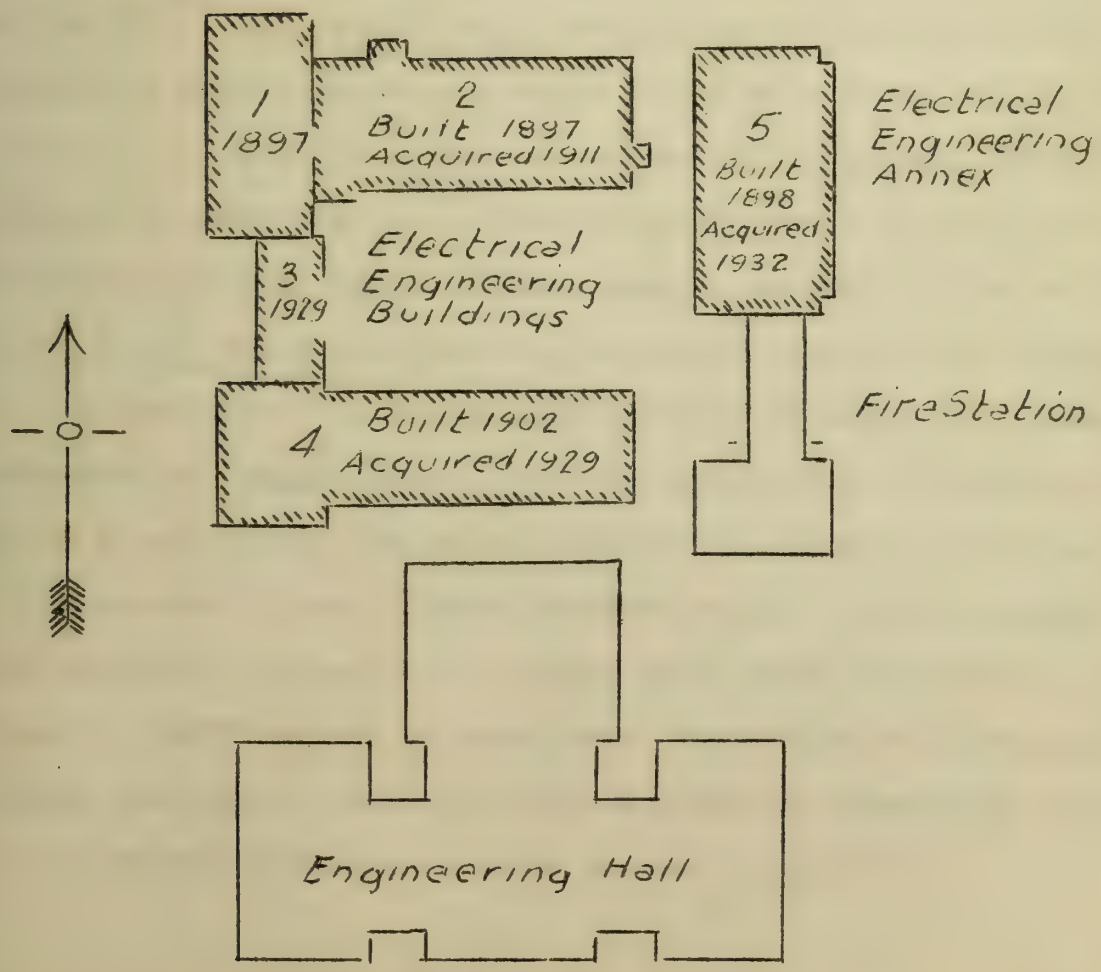


FIG. 2

The total floor area of the above spaces being used, not including corridors, stairways, rest rooms, etc., is approximately 33,000 sq. ft.

In addition to the above space, the Electrical Engineering Department is now using 11 classrooms and one office room in Engineering Hall and one classroom in the Transportation Building. With the one exception mentioned above, all department staff offices are in the Electrical Engineering Buildings. The inconvenience and inefficiency caused by having offices in one building and classes in other buildings, where demonstration apparatus is desirable, are obvious.

The machine laboratory is divided into two rooms more than 100 feet apart, one of which is on the second floor of Area No. 1, and the other on the first floor of the western end of Area No. 4. The wooden laboratory floor in Area No. 1 permits excessive vibration of the whole floor. Binding post screws work out and pivots of delicate instruments are damaged. This also contributes to inaccurate data. Loosening up of screws and contacts have contributed to several cases of severe damage to equipment. Noise and vibration due to the type of floor and construction are excessive and extend to the floor above where the offices and electronics and ultra-high frequency laboratories are located. This is not only annoying but it interferes with work and is very tiring. Due to necessity for more equipment in the past, it has been necessary on two different occasions to move the machine benches closer together. As a result, the working space around the machines is inadequate for safety as well as convenience. Six or eight men working on two different experiments, together with tables holding instruments and wiring, are often crowded into a space of about six feet by eight feet.

The instrument room is located about midway between the two laboratory rooms. This general arrangement leads to less efficient use of machines and instructors, and considerable shifting of semi-portable equipment. The instrument room should open into or be closely adjacent to the laboratory for maximum efficiency.

At the present time, all our classrooms, not including that for illumination, are outside of the Electrical Engineering Building, excepting those cases where the classes meet in the laboratory for discussion, even though other laboratory classes are in progress at the same time. The latter arrangement is unsatisfactory but the alternative is to meet in some other building and, after class discussion, proceed to the laboratory building and continue the class period. This also is not satisfactory because of the waste of time.

It is considered almost imperative that the classrooms have electrical circuits available for use in illustrating fundamental principles in theory courses. The present classrooms are not so equipped, and it would be very difficult to provide these circuits in most cases. Furthermore, although the circuits were made available, it would be even more difficult, if not impossible, to transport the demonstration equipment back and forth from one building to the other. This is illustrated at the present time by a course in electronics scheduled to meet in a room on the fourth floor of Engineering Hall. A cathode ray oscilloscope and some other demonstration apparatus are considered desirable. However, carrying 150 pounds of equipment from the electronics laboratory on the top floor of the electrical engineering laboratory to this classroom and then taking it back again after class is too difficult.

Classrooms should be located reasonably close to the corresponding laboratory in order to facilitate movement of demonstration apparatus.

With the exception of the classroom in the illumination laboratory, the department has no classroom adequately equipped for visual aids, and this one room is equipped for illumination work only.

If the proposed new space is provided, the present space cannot be used profitably by the Department of Electrical Engineering. The proposal is intended to eliminate the scattering of classrooms, laboratories and offices, as well as inadequate or insufficient space. No matter how adequate the classrooms, if they are scattered or separated very far from the instruments and equipment, the difficulties of transporting demonstration instruments and equipment will prevent their use.

IV. POST-WAR DEVELOPMENT

Plans for post-war development are also included in plans for the future. It is believed that the post-war enrollment will exceed the normal future enrollment for only a short period of time. A new building should be designed and constructed on a long-time basis. All the floor space and facilities, including the new ones in the proposed building, are based on estimated long-time needs. About 10 per cent of the proposed space is new because of new developments during the war, and about 25 per cent is new because of inadequacy of the present space in the electrical engineering buildings which has existed for some time. About 30 per cent is due to the expected increase in enrollment.

The number of teaching staff members will probably be increased by eight to ten men as given in the estimate above under "Department Load".

V. PROPOSED NEW SPACE

The proposed new space should be in one permanent building located as conveniently as possible within the Engineering group on the campus. The building should be constructed with movable inner walls to make it as flexible as possible. The Murray Hill Laboratory of the Bell Laboratories in New Jersey, erected about three years ago, is an outstanding example. The inner walls are made adjustable, so that any space may be expanded or contracted at will. The movable partitions have built-in electrical circuits and shielding and are accoustically treated, thus giving all the advantages of a permanent construction in addition to great flexibility.

All laboratories which may be affected by interference from any outside source should be carefully shielded electrically.

All floors should be provided with ducts or raceways so that now and in the future, outlets may be located at the most desirable points. The extra expense of such an arrangement of construction is relatively small when measured against the advantages of the flexibility thus provided. Also, raceways should be provided around the walls of each room with ducts or raceways connecting to the floor network so that electrical circuits may be installed to the most convenient points at any time in the future without involving large extra expenses and unsightly results.

Provision has been made for research rooms, each of which may be used by one or two individuals. It is the intention of the Department of Electrical Engineering that every man on the teaching staff will have ample space available for research. Also, additional space is provided for student research. Most of the research problems in electrical engineering will not require much research space, hence research on many different problems may be in progress at the same time. Proper wiring connections to the individual

research rooms, as indicated under "proposed new space" will aid in utilizing efficiently the space necessary for research. A separate space is included specifically for the Engineering Experiment Station work in Electrical Engineering.

The estimated areas needed in the various types of rooms are given below, together with special notations where necessary:

Type of Rooms	Total Area (Sq. Ft.)
Classrooms (12)	7,200
Machine laboratory	12,000
Applications laboratory	5,000
Instrument rooms (To protect about $100,000 worth of instruments and other equipment)	
For power laboratories	1,000
For communication laboratories	500
Laboratory conference rooms	5,000
Laboratory office rooms	400
Museum	1,000
Meter and relay laboratory	2,000
Laboratory demonstration rooms	1,000
Electrical design room	1,000
Electrical measurements laboratory	2,000
Apparatus storage room	300
Electronics laboratory	2,000
Radio laboratory	2,000
Ultra-high frequency laboratory	2,000
Transmission and communications laboratory	2,000
Apparatus construction room	500

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]	[illegible]
[illegible] (10)	[illegible]
[illegible] laboratory	[illegible]
Applications laboratory	[illegible]
Instrument room (30 pratt [illegible] work of instrumental [illegible] equipment)	
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
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[illegible]	[illegible]

Type of Rooms	Total Area (Sq. Ft.)
Servomechanism laboratory	1,500
Aeronautics laboratory	3,000
Illumination lecture-demonstration room	2,000
Photometry room	4,000
Photometric tunnel	1,500
Distribution photometer room	350
High tension laboratory	6,000
Large lecture room (Water, gas, air and vacuum should be piped to a table in the front of room)	3,000
Reading and study room	1,000
Calibration laboratory (This is a place for precision measurements and good work can be done only in a constant temperature room. The temperature should be kept constant within 1°F. The room should be as nearly dust free as possible, in order to protect delicate instruments.)	1,000
Meter repair and maintenance room (Should have fairly close temperature control and be reasonably dust free.)	1,000
Power supply room for the above	150
Battery room (Adequately ventilated)	700
Shop rooms (4)	4,000
Department office rooms	800
Vault	150
Office rooms (20)	5,000

Research rooms (25) (Each research room should be provided with at least the following:

- 1 outlet for compressed air
- 1 outlet for gas
- 1 outlet for water
- 1 d.c. supply circuit
- 1 a.c. supply circuit
- 4 free, 3-wire circuits each of which may be used to connect with any point in the laboratories.)

Type of Rooms	Total Area (Sq. Ft.)
Dark room	150
Research laboratory	6,000
Seminar and conference room	500
Engineering societies room	200
Storage space	600
Substation room	400
Total	94,800

It is expected that adequate arrangements will be made for such factors as illumination, sound, insulation, ventilation, and air conditioning. Nothing has been said about space for hallways, stairways, rest rooms, emergency exits, janitor's room, space for cleaning equipment, building auxiliaries, ventilation equipment and etc., since the committee felt that the architects were in a much better position to handle these problems. Certainly a freight elevator should be included for use in moving equipment from one floor to another.

VI. FUTURE DEVELOPMENT

The probable future load, indicated above under "Department Load", was part of the basis for estimating the proposed new space. There have been several new electrical developments of the war including ultra-high frequency, radar, and servomechanisms. These are included in the estimates. The general proposals under "proposed new space" includes a suggestion for making the building very flexible, by means of adjustable inner walls. This would make it easier to readjust the available space to make room for new developments not now in sight, as well as to make changes in spaces allocated to developments now being planned for. The proposed arrangement of the building is

itself a recent development. If this type of construction is not too expensive, it should be used because it would prolong the useful life of the building, and add to its convenience.

VII. SUMMARY

The Department of Electrical Engineering has never had a building designed especially for electrical engineering and hence increases in building space have been obtained by taking over old buildings designed for other purposes. The present building is not only inadequate in available space, but also inadequate from the standpoint of arrangement of available space.

Neighboring colleges have much more adequate space and facilities. They also present a far better appearance. Predicting the future is at best an uncertain task. However, due largely to the influences of the war, a considerable increase in enrollment is to be expected during the post-war period with comparatively little decrease for the immediate future years thereafter, provided adequate preparation is made to meet the needs.

The total estimated floor area, exclusive of corridors and service rooms, needed for the proposed new building is divided as follows:

	Sq. Ft.
Classrooms	10,600
Laboratory and calculating rooms	39,850
Office rooms	6,200
Research rooms	22,000
Instrument rooms	1,500
Construction rooms	5,500
Miscellaneous rooms	9,150
Total Area	94,800

These estimates were the results of studies made by the committee in consultation with the entire staff of the department. These were estimated minimum satisfactory requirements based on the assumption that areas could be expanded, contracted, or subdivided as necessary to meet the actual needs at a particular time, thus making possible the use of the entire space, although the emphasis may shift from one branch of the electrical engineering field to another.

It was estimated that of the proposed space, 10 per cent was due to recent developments in electrical engineering, 25 per cent was due to inadequacy of present space, and 30 per cent was due to expected increase in enrollment.

Prepared by Department Building Committee:

M. A. Faucett
G. H. Fett
C. A. Keener
L. B. Archer, Chairman

PROJECT ENG. 2

MECHANICAL ENGINEERING BUILDING

The Department of Mechanical Engineering submits to the University Building Committee the following information relative to building needs of the Department.

I. DEPARTMENT LOAD

1. Present Instructional Load. In Fig. 1 are shown curves for: the number of students registered in all courses in two semesters, including service courses; the number of students registered in the entire Engineering College; the number of students registered in Mechanical Engineering alone; and the number of instructors in Mechanical Engineering.

These curves show the trends over the years from 1914 to 1943 and indicate that in 1942-43, 750 students in Mechanical Engineering were served by 27 instructors.

2. Increase in Number of Students. The curves for student enrollment show the following:

A sudden increase in student enrollment occurred after World War I, resulting in an increase of from 250 to about 600 students. Student enrollment varied within a narrow range of from 225 to 400 students for the period between 1921 and 1935. Following 1935 a tremendous expansion in student enrollment occurred, in which the student load practically doubled in ten years time.

In the years between 1940 and 1942, two out of five students registered in the Engineering College were also registered in the Department of Mechanical Engineering.

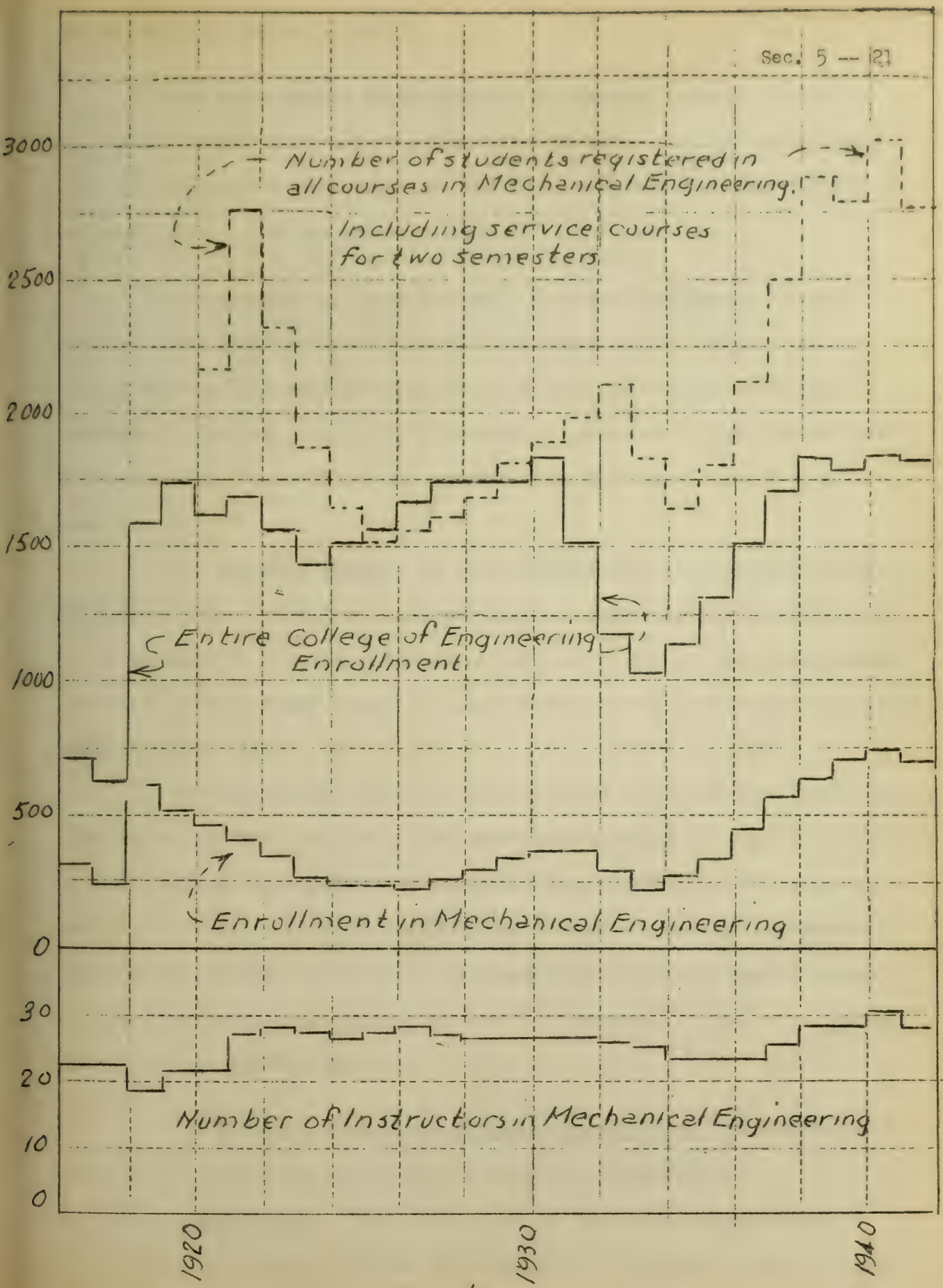
3000
2500
2000
1500
1000
500
0
30
20
10
0
Number of students registered in all courses in Mechanical Engineering.
Including service courses for two semesters
Entire College of Engineering Enrollment
Enrollment in Mechanical Engineering
Number of Instructors in Mechanical Engineering
1920
1930
1940

Fig. 1.

The total number of students in all courses serviced by the Department likewise increased at a proportionate rate. The service extended to students in other departments of the University has constituted about 50 per cent of the total departmental load.

3. Increase in Staff Members. The curve for number of staff members shows that the number has remained practically constant over the period between 1921 and 1944. At the same time the student enrollment practically doubled. In brief, a tremendous expansion in load has occurred in the past 10 years without any corresponding increase in the size of the staff.

4. Probable Increase in Instructional Load in Post-War Period. With the return of men from the armed forces the department can expect a decided increase in students. Out State Legislature has already passed legislation to further their education, and our Congress is considering appropriations for more aid.

In the post-war period, a temporary and sudden increase in student load is anticipated, similar to that experienced during the years from 1917 to 1919, during which period the enrollment was doubled. In the post-war period, the department should be prepared to handle a student registration of from 1200 to 1500 students, of whom many will be war veterans. Beyond the post-war period, the department should be prepared to handle registration of at least 1200 students.

5. Influence Tending to Stimulate Registration. The following are some of the influences tending to stimulate registration:

a. Aeronautical Program. During the past 20 years the department has offered introductory courses in aeronautics. A marked increase in par-

ticipation in the aeronautical program is being planned along the following lines:

(1) Enlargement of engine testing laboratories for instruction and research.

(2) Building of small wind tunnels for student instruction.

(3) Establishment of laboratories for instruction and research in fuels and carburetion, instrumentation, heating, and control mechanisms.

The aeronautical program of the department will require new space, new equipment, and new staff to take care of the anticipated influx of students.

b. Internal Combustion Engines. No single phase of engineering has made such rapid strides as the field of internal combustion engines and fuels. Power generation by internal combustion engines will be of ever increasing importance, and the department anticipates that a heavy demand for instruction and research in such fields will exist.

c. Production and Design. A large proportion of Mechanical Engineering graduates now enter, and will continue to enter, the field of design and production. The offering of a correlated program in this field should stimulate student interest.

d. Metal and Plastics Fabrication. Metal fabrication along the lines of powder metallurgy, welding, die casting, die forming, and permanent mold castings, together with such developments as high-speed tool steel for metal cutting, induction heating and hardening, and time-study will require new approaches and new equipment.

e. Housing and Building. The department anticipates an increased demand in studies and research in housing and building fabrication. Such activities will probably consist of heating, ventilating, air conditioning,

refrigeration, production methods for pre-fabrication of building parts, industrial management, and the production of component parts and mechanical equipment necessary for buildings.

6. Research Activity. Research has been an important phase of departmental activity. The total number of publications by the Engineering Experiment Station written by the staff of the department from 1905 to 1944 is 82, or approximately 20 per cent of the total issued by the Station. In Table 1 is shown a listing by subject matter, and in Fig. 2 is shown the yearly output of publications.

In the early years, prior to 1914, much of the emphasis was on coal and combustion of coal. During the years of 1920 to 1932, a well balanced and diversified program of research was maintained, including research on fuels, combustion, fluid flow, heat transfer, thermodynamics, heating and ventilating, design, and metal processing. During the past 12 years research has been confined largely to heating, ventilating, and air conditioning studies, a large proportion of which has been carried on as cooperative investigations with industry.

The decline in the diversity of research projects in the past 12 years, following the depression years, coincides with the decline in the participation by the instructional staff in graduate study and research, and also with the marked increase in the load of our teaching staff. The conclusion is inescapable that the heavy teaching load imposed upon the instructional staff during the past 12 years, has not allowed time for professional development in the way of research, and in the production of technical papers and books. Research in Mechanical Engineering also depends to a large extent upon sufficient space and equipment for conducting the experiments, both of which are lacking.

Table 1.

Research Publications of Engineering Experiment Station by M. E. Staff

Subject Matter	No. of Bulletins and Circulars	Approx. Period of Maximum Output
a. Heating, ventilating, and air conditioning	27	1924-1943
b. Coal and Combustion	16	1906-1910
c. Thermodynamics	11	1913-1933
d. Fluid flow and Heat Transfer	10	1927-1932
e. Metal Cutting & Metal Properties	5	1917-1932
f. Moulding Sand and Core Oil	4	1929-1936
g. Stress Analysis & Design	4	1930-1934
h. Machinery and Equipment Tests	3	1905-1912
i. General	2	1905-1910
Total Number of Bulletins and Circulars	82	

(Above list does not include the 14 publications dealing with railway locomotives and car wheel investigations conducted by the staff of the Railway Department, which has been absorbed by other engineering departments.)

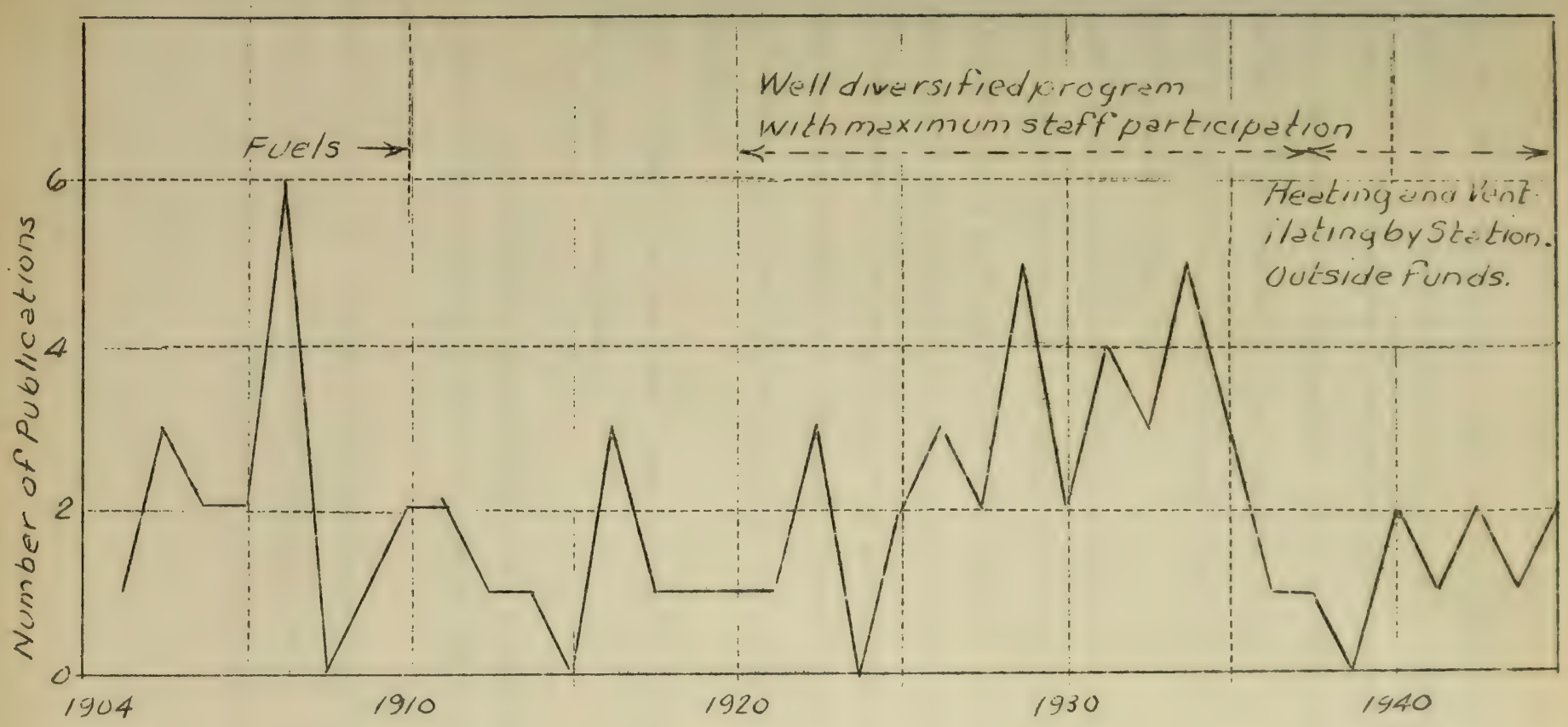

Fig. 2. Publications by Staff

The following general comments and suggestions may be made relative to the future research activities of the Department:

a. A well balanced research program consisting of both fundamental research financed by the University, and cooperative research financed to a large extent by industrial organizations and by technical societies should be the aim of the department. The department should be in a position to offer a considerable number of research fellowships, or half-time research assistantships.

b. There should be an increase in instructional staff, and a greater amount of office and laboratory space should be made available in order to permit more general participation of the instructional staff in research.

c. Space should be available for conducting research in the fields of combustion engines, instrumentation, metal processing, aeronautics, design, production engineering, refrigeration, heating and air conditioning, and housing, all of which have undergone tremendous developments in the past decade.

d. Modern equipment and instruments should be made available for the conduct of these investigations.

7. Assistance Rendered to Other Parts of the University. Assistance rendered by the department to other parts of the University consists primarily of:

a. Service courses for students in the departments of electrical, chemical, agricultural, civil, architectural, ceramic, and metallurgical engineering and students from architecture and industrial education.

b. Cooperative research with the College of Medicine on "Physiological Aspects of Air Conditioning," and more recently on an army research project. The services of two staff men, and one laboratory technician have been utilized up to 1944.

c. The part-time service of one staff member has been assigned to the University of Illinois Foundation in connection with work dealing with the patents on the Illinois Smokeless Furnace.

d. The part-time service of one research staff member is devoted to duties as Assistant Director of the Engineering Experiment Station.

e. The part-time service of one staff member is devoted to editorial duties as an Assistant to the Director of the Engineering Experiment Station.

f. The part-time service of one staff member is devoted to assisting the Department of Chemistry on an N.D.R.C. war project.

II. PRESENT SPACE

1. Inadequacy of Present Space. The following items are shown in Table 2: net floor area, dates of construction, types of construction, and condition of present space. No increase in space has been provided for the Department since 1916. The inadequacy of the present space is most acute in the Machine Tool Laboratory, the Wood Shop Building, the Power Laboratory, and the Transportation Building.

a. Machine Tool Laboratory

(1) Classroom to small to accommodate classes.

(2) New space required for metal cutting and motion and time study laboratories.

(3) Washroom and locker rooms not large enough for number of students.

(4) Floor will not support heavy machine tools, and it is necessary to place supports under floor.

(5) Tool room space not adequate for small tools.

b. Wood Shop Building.

(1) One-third of building space is occupied by the Physical Plant and the Industrial Education Department.

(2) Noise of wood working machinery makes instruction difficult.

(3) Some instructional work must be conducted in the basement where light and ventilation are bad.

(4) Freight elevator needs to be replaced. Appropriation was allowed to purchase one two years ago, but it could not be secured on account of O.P.A. regulations.

c. Power Laboratory.

(1) Floor and foundation not suitable for heavy machinery.

(2) Crane can service only about one-sixth of the total floor area.

(3) Low basement head room, poor lighting, and ventilation.

(4) Entire building poorly heated and ventilated.

(5) Inadequate classrooms.

(6) Worst lecture room in the University.

d. Transportation Building.

(1) Space borrowed from General Engineering Drawing Department, which is in need of additional space.

2. Possible Disposal of Present Space. The possible disposal of the present space is indicated under the four following headings:

a. Machine Tool Laboratory.

(1) Space and equipment could be used by the Industrial Education Department.

(2) Space could be used by Theoretical and Applied Mechanics Department for the storage of inactive equipment thereby releasing valuable space in Talbot Laboratory for instruction and research.

(3) Space could be used by Physical Plant Department.

Table 2.

Space Occupied by the Department of Mechanical Engineering

Building	Net Floor Area*	Date of Construction	Type of Construction	Condition of Present Space
Machine Tool Laboratory	12,460	1902	Single story	Not fireproof
Wood Shop and Foundry	16,860	1902 1904	Two-story	Occupied by M.E., Physical Plant & Ind.Educ.Dept.
Power Laboratory	39,770	1905, 1916 addition	Saw tooth, brick, and tile wall, wood roof	Occupied by M.E. & Physical Plant. Poorly heated & ventilated. Leaky roofs.
Transportation Building	7,320	1912	Three-story. Brick	Space borrowed from G.E.D. Department
Total	76,410			

b. Wood Shop and Foundry.

(1) Space could be used by Industrial Education Department.

(2) University High School - Manual Training.

(3) Space could be used by Physical Plant Department.

c. Power Laboratory.

(1) Physical Plant; also Theoretical and Applied Mechanics Department.

d. Transportation Building.

(1) General Engineering Drawing Department.

III. POST-WAR DEVELOPMENT

1. General. The present staff and equipment are not adequate to take care of any anticipated increase of the undergraduate and graduate student loads in the post-war period. A complete discussion of the load in the post-war period and plans for development, the reasons for planning, and the necessity for an increase in the staff has been given elsewhere in this report.

2. Consequences of Failure to Acquire New Facilities. On the assumption that new facilities are not available in the post-war period, the department is faced with two alternatives:

a. To lower its teaching standards by increasing the number of students handled in lecture and laboratory classes, or

b. To turn away students by raising educational requirements.

The first alternative would lead to poorer training for all groups of students. The department has felt it highly desirable to "personalize" the teaching by maintaining smaller numbers in classrooms, and particularly in laboratory sections, and feels that any lowering of teaching standards should be avoided.

The second alternative may result in denying training to returning veterans, and others who have lost touch with education for several years.

In the post-war period, prior to the availability of a new building some steps will be necessary to acquire more temporary classrooms and office spaces. As to where such temporary space could be obtained the committee frankly has no satisfactory solution to offer at present.

IV. PROPOSED NEW SPACE

1. Net Floor Area. The present total floor area is 76,000 sq. ft. Additional space amounting to about 74,000 sq. ft., or a total building area of about 150,000 sq. ft. is desired, divided approximately as follows:

	Space	No. of Rooms	Total Floor Area
a.	Class, Lecture, and Computation Rooms and Design Rooms	35	30,920
b.	Auditorium	1	3,500
c.	Office Space	60	13,530
d.	Laboratories and auxiliary space	30	78,120
e.	Administration and student activity	6	2,070
f.	Stock and Instrument Rooms	4	5,000
g.	Department Service Rooms	3	990
h.	Storage Rooms	8	10,970
i.	Toilet and Washrooms	7	4,500
j.	Janitor Room	1	400
	Total Space		150,000

2. Type of Construction and Special Services.

a. Four stories above ground level.

b. Heaviest machinery on ground level on separate foundations.

c. Fireproof construction.

d. Soundproofing of noisy machinery.

e. Vibration insulation.

f. Special lighting for drafting room.

g. Freight and passenger elevator service.

h. Air conditioning and ventilation of classrooms, auditoriums, and office spaces.

i. Ventilation of foundry, chemical rooms, welding and heat treating rooms.

j. High pressure steam.

k. Compressed air.

l. Gas and gasoline storage.

m. D.C. and A.C., 110 v., 220 v., and 440 v.

3. Location. The proposed location is at Green Street and Mathews Avenue.

4. Special Rooms. The following rooms will probably be required:

a. Constant temperature and constant humidity room.

b. Cold rooms.

c. Pressure and altitude chamber.

5. Relief of Present Congestion. The Department requests an entirely new building to relieve the congestion in the present four buildings and to provide for additional activities.

6. Provisions for Expansion. Provision has been made for anticipated expansion of activities.

7. General Comments.

a. There is no industrial plant easily accessible to the Department which could be used to show students more advanced phases of mechanical development. It is, therefore, imperative that fairly modern equipment be made available on the campus.

b. Of some 38 major pieces of mechanical equipment in the Power Laboratory, only seven have been installed since 1934, and of these seven, four units are small sized truck engines. The larger portion of the equipment is from 15 to 25 years old, which is "old age" in terms of mechanical engineering development. However, the main limitation is not so much the old age of existing equipment, as it is the lack of additional newer pieces of equipment that are commonplace items in industry.

c. Space requirements around machinery must be ample in order to reduce hazards to student operators and to facilitate instruction. The machine tool laboratory, especially, is crowded - more so than is imperative for safety.

d. From the preceding discussion it seems evident that the acquisition of a new building will not satisfy the needs of the Department but new equipment must be provided also. Since, during any one year, it is not possible to secure a sufficiently large appropriation to permit the acquirement of a major piece of equipment, or at best not more than one such piece, it is imperative that at the time appropriation for the building is made, an additional appropriation for equipment sufficient to provide for most of the necessary additional apparatus required must also be made.

e. The Department recognizes that the request for a complete new building and the necessary equipment for the various laboratories, requires a large appropriation. It is, therefore, suggested that the proposed building be designed on the unit principle. Such a design would permit erecting the main building, which would house the majority of the offices, classrooms and drafting rooms, and a unit taking care of the Shop Laboratories. At a later date, a second unit could be added for housing the Mechanical Engineering Laboratory.

V. FUTURE DEVELOPMENT

1. Diversity of the Field of Mechanical Engineering. Mechanical Engineering is a basic division of engineering that has grown concurrently with industrial development, and will flourish as industry flourishes. The graduates from the department enter such diversified industries as:

Power generation
Manufacturing processes
Metal production, processing, and forming
Fuel production and utilization
Transportation - air, land, and water
Housing
Food processing and storage

The field is sufficiently diversified so that the demands for graduates are not materially affected by temporary shifts in industrial activity from one phase to another. The Mechanical Engineering Department will probably continue to carry an extremely heavy proportion of the load of the Engineering College.

2. Requisites for Future Growth. The future growth of the department will depend upon the character of the instructional and research services that are made available. Two nearby institutions have recently re-

organized their engineering schools and promise to become significant factors in the Mechanical Engineering field. If this department continues to exist with limited space and to operate with obsolescent equipment, it will relinquish its advantageous position as one of the stronger departments in the country.

3. Necessity for a Strong Department. A strong department of Mechanical Engineering adequately housed, well staffed, and well equipped with machine tools will be able to enter more actively into the industrial development of the state and the training of its citizens. Such are the objectives of this department.

VI. SUMMARY

In the preceding sections of this report, evidence was submitted showing that in the past eight or ten years, the instructional load of the Department has practically doubled with no increase in the teaching staff. It was also pointed out that the Department was badly in need of more equipment and space for laboratories, design and class rooms, and research in order to maintain a leading position in the new developments taking place in the rapidly expanding field of Mechanical Engineering. Due to the factors just mentioned, the Department finds itself handicapped when its work and activities are compared with those of Mechanical Engineering Departments connected with other institutions.

With the development of the University's aeronautical program, the Department of Mechanical Engineering plans to offer additional courses in Aeronautical Engineering. The proper handling of such courses requires more space, new equipment and additional personnel.

The research program of the department has been seriously curtailed by the heavy teaching load imposed upon the instructional staff by the very large increase in the student enrollment in courses offered by the department and by lack of space and equipment.

The needs of the department of Mechanical Engineering can only be fully satisfied by supplying it with a new modern building for housing the various laboratories, design and classrooms, and offices, and installing in the laboratories the latest type of equipment.

Prepared by Department Committee on Buildings.

PROJECT ENG. 3a

ADDITION TO PHYSICS LABORATORY

I. INTRODUCTION

The need for an addition to the Physics Laboratory has been acute since 1936 and has become more acute each year since then. From time to time this problem has been discussed with Dean Enger and the University Building Committee. By 1938, Dean Enger recognized the need for more space for instruction and research in physics and emphasized that "An addition to the Physics Laboratory has probably become the greatest building need in the College of Engineering. ..... The need for additional space is very urgent." Since then, due to the development of the betatron and cyclotron projects, the need has become more acute. By 1940-41, only three class rooms were left in the building. Therefore, it is proposed that an addition to the present building be built to the north of the Physics Laboratory and the the size be such that the available space be doubled.

II. DEPARTMENT LOAD

The registrations in courses in physics at five year intervals starting with the first year that the Physics Laboratory was occupied are given in Table I.

From these data it is evident that the number of students, in all classes, has more than doubled since the building was built. Also, the largest increase in a given period occurred between 1934-35 and 1938-39.

The research activity actually has increased even more than these figures indicate. Between 1929 and 1939 eleven exceptionally able and energetic research men joined the department. As a result, three times as many research papers were published during this period than in any other.

Table 1.

Year	Sophomore Registration	Advanced Undergraduate Registration	Graduate Registration	Total Registration
1909-10	1552	170	63	1785
1914-15	1708	189	67	1964
1919-20	2550	213	54	2817
1924-25	1887	233	86	2242
1929-30	2552	334	134	3020
1934-35	2205	340	128	2673
1938-39	3377	347	177	3901
Ratio $\frac{\text{Reg. 1938-39}}{\text{Reg. 1909-10}}$	2.2	2.0	2.8	2.2

Since 1940, the betatron has come into existence and as a result more research space is needed. This, we hope, will largely be provided by building a special Betatron Laboratory (Project Eng. 3b). Also, the large cyclotron has been constructed and put into operation in the Nuclear Radiations Laboratory where some research space is available. However, for both of these projects and the researchers working with them, it will be necessary to have research rooms available in the Physics Laboratory where radiation from the cyclotron and betatron will be negligible.

Much of the research work of the department was interrupted by the war. In fact, the only projects still in progress are the betatron, the cyclotron, and the uranium research. After the war, one may expect certain

of the projects discontinued because of the war, to be reactivated; i.e., the linear accelerator, mass spectroscopy, line and band spectra, and research in acoustics. Also, one may expect the uranium project to expand.

New research in electron physics and micro waves and in associated fields may be initiated by members of our staff now on leave when they return. Many of them have had an outstanding part in the wartime developments in these fields and will command a strong position for research in these unique fields.

For some years we have considered initiating research in cosmic rays. The development of the betatron and the possibility of producing artificial cosmic rays with it make the initiation of a program of cosmic ray research a natural and important adjunct to the betatron program.

In order to handle the wartime teaching load it has been necessary to discontinue, for the duration, twelve advanced undergraduate and graduate courses. This is about 40% of the courses offered in normal peace time. Another course, "Modern Laboratory Practice", Physics 191, has been forced out of its regular laboratory quarters to provide elementary laboratory space for the Army and Navy. For the same reason, all of the old acoustics laboratory and the associated research rooms and the fourth floor corridor in the Physics Laboratory have been converted into temporary elementary laboratory space.

Much of the second floor east wing in the Physics Laboratory is being used by the betatron project. Formerly this space was used by the linear accelerator and research graduate students.

From the above it seems clear that the Physics Laboratory did not provide adequate space for instruction and research prior to 1940, and that the situation is more critical now. In fact, it would be impossible to

provide space for elementary laboratories for the present Army and Navy students if so many of our senior staff were not gone for war work and if on that account research work in the department had not been greatly reduced.

What may we anticipate as the post war needs for instruction and research? It seems reasonable to estimate that the physics department will have 2000 to 3000 (say 2500) students in elementary physics after the war. This is two to three times the pre-war figure. The estimate is based on the following educational trends:

a. Science in general and physics in particular has received much emphasis during the war. High schools may be expected to emphasize those subjects more after the war than formerly. Therefore, larger registrations in the College of Engineering may be expected.

b. The Veterans Administration and Federal Subsidy for postwar education of men discharged from the armed forces may be expected to supply large numbers (1000) of men in science subjects.

c. Industrial companies have learned the value of physicists during the war and will continue to employ physicists in larger and larger numbers. This will lead to larger registrations in physics.

III. PRESENT SPACE

In 1909, when the Physics Laboratory was completed, the building had approximately 36,000 sq. ft. of floor space in class rooms, laboratory, offices, etc. (excluding halls, stairways, etc.) used for instructions and research in physics. The basement and fourth floor were designed so that they were unsuitable for use except for photographic laboratories of another department. By 1939-40 the total floor space in use was about 52,500 sq. ft.

It had been necessary to make such adjustments and improvements in the basement and fourth floor that that space could be used in spite of the intent of the designers of the building. Table II shows the use of floor space in the period 1936-40. By 1940 the demand for research space had become so acute that all but three necessary class rooms had been removed from the building. All other classes were held in other university buildings.

Table 2.

	1936		1940		Postwar with proposed addition	
Type of Room	%	sq.ft. floor space	%	sq.ft. floor space	%	sq.ft. floor space
Class Rooms	10.	5,245	5.5	2,958	11.1	11,298
Lecture Rooms	9.7	5,070	9.7	5,070	8.5	8,620
Elementary Labs.	22.8	11,970	22.8	11,970	25.3	25,669
Advanced Labs.	11.2	5,880	15.5	8,130	12.6	12,750
Research Labs.	25.9	13,560	28.3	14,875	20.1	20,453
Office Rooms	7.2	3,782	10.9	5,711	10.6	10,724
Shops	4.4	2,320	4.4	2,320	5.5	5,539
Misc. (Storage Sw. board, library, etc.)	8.8	4,620	2.9	1,500	6.3	6,373
Totals	100.	52,447	100.	52,534	100.	101,426

In 1909, the ratio of floor space to student registration in physics was 2 sq. ft. per student registration. By 1939, even after adding 16,500 sq. ft. of floor space from basement and fourth floor, this had dropped to 1.8 sq. ft. per student registration. A further comparison is given as follows: In 1939, there were about 1000 students making up the 3901 student registration in courses. This gives a floor space of 52.5 sq. ft. per student. Further comparative data for other universities are given in Table 3.

Table 3.

Physics Department	Floor Space / Student
Illinois (1909-10	114 sq.ft./ student
(1934-35	79 " " " "
(1938-39	53 " " " "
(Proposed future	100 " " " " (approx.)
A large, eastern university 1939	94 " " " "
A small, eastern university 1939	82 " " " "
A small, midwestern university 1939	170 " " " "
A large, western university 1939*	21 " " " "

*The source of this information writes the following comment: "In conclusion, I may say that in respect to our total enrollment, as well as in respect to the number of graduate students, we probably have the smallest amount of space of any first-class university in the country. We also are thus frightfully in need of additional space." This large western university also has two large buildings, used exclusively for nuclear research, of floor space approximately 12,000 sq. ft. This value is not included in calculating the figure in Table 3.

The present Physics Laboratory is a good substantial building and there is no reason why the existing space should not be used for physics. The proposed addition is much more desirable than any other solution. The main deficiencies of the present building lie in the need for more library space and a complete modernization and rewiring of the electrical power lines in the building.

IV. POST-WAR DEVELOPMENTS

Some reasons for expecting increases in enrollment in physics in the post-war period are given above under II. Also, reasons for additional research space were given there. Further, it has been recognized that a new course in physics for non-technical students in other colleges of the university is highly desirable and should be initiated as soon as possible. The field of biophysics is now, important and developing. Also, there is urgent need for advanced undergraduate and graduate laboratory in electronics, acoustics, heat, and special problems for students who plan to go into industrial physics. The present building provides no floor space for such laboratories. All of these trends point to larger registrations in physics and the need for more space.

Assuming that these larger registrations materialize, we may need to double the staff and that in turn will demand more research space.

V. PROPOSED NEW SPACE

An addition of about 50,000 sq. ft. is proposed. It should be built just north of the present building and should be of the same general construction and type. Preliminary plans of the proposed addition have been prepared. There will be a need for special electrical power outlets in all rooms, general electrical services, gas, water, air, etc. Details of special rooms must be left until final plans are drawn but an estimate of an extra $100,000 for such special facilities has been made.

VI. FUTURE DEVELOPMENTS

Developments in physics have been so rapid in recent years that future lines of research cannot be wholly predicted. For example, the betatron was not known in 1940 and now is one of our most important research

projects. All that one can predict is that one will need more space and funds for research and instruction than ever before.

VII. SUMMARY

a. The present Physics Laboratory, built in 1909, afforded at that time about 114 sq. ft. of floor space per student.

b. By 1939-40 the above ratio had dropped to 53 sq. ft. per student due to increased enrollment and research activity.

c. By 1940, 15,000 sq. ft. of floor space in the Physics Laboratory, originally designed so that it could not be used, was in use, and even then the demand for space was so acute that only three necessary classrooms could be kept in the building.

d. The present and proposed use of floor space is much the same as in other first class institutions.

e. In general, other first class institutions provide approximately 100 sq. ft. per student floor space. Those institutions who do not have that much feel cramped for space.

f. All trends indicate that enrollments in physics may be doubled in the post-war period as compared with those of the immediate pre-war period.

g. The present building provides excellent facilities for work in physics, but urgently needs repowering (Project Eng. 3c) and a larger library (Project Eng. 3d).

h. The proposed addition to the north of the present Physics Laboratory would about double the available space and except for unforeseen circumstances probably satisfy our needs for many years.

1. New fields are sure to develop in physics after the war. They include: micro waves, cosmic rays, biophysics, electron physics, etc.; nuclear physics, including betatron and cyclotron work will continue to be of prime importance.

Prepared by Physics Department Building Committee.

PROJECT ENG. 3b

BETATRON LABORATORY

I. INTRODUCTION

The betatron was invented by D. W. Kerst of the Physics Department of the University of Illinois in 1940. It is a machine which will accelerate electrons to higher energies than obtainable by any other laboratory means and for this reason it opens up a great new range of physical phenomena for study. It also has immediate and unique applications in certain industrial purposes and definite possibilities in medical therapy for the treatment of cancer. The betatron has opened up fields of fundamental and applied research at least as extensive as those of the cyclotron and Illinois has an opportunity to maintain its leadership in the most promising development in physics in recent years.

The first betatron produced electrons of two million electron-volts (mev) energy; the second one, 20-mev electrons. Much important work can be done with machines of these sizes but the really unique fields of investigation can be entered with a machine producing 200 to 250 mev electrons. Such a machine is now being planned by Dr. Kerst (Project Eng. 3c).

The purposes of a betatron laboratory will be: (1) to house two machines of the 20-mev size; (2) to provide laboratory and shop space for scientists and students to do experiments with these machines; (3) to make provision for the necessary laboratory and shop facilities for a 250-mev betatron. This machine is a project in itself and will be housed in an addition to the laboratory of this proposal. The big machine and its housing will be discussed in a separate proposal.

II. PRESENT SPACE

The 20-mev betatron now in operation is installed in a corner of the basement Abbot Power Plant. This location is for several reasons very unsatisfactory as a place for betatron research:

1. There is no possibility of expansion for the installation of additional machines of the same or larger size.
2. There is no space for small research laboratories for individual research workers use in constructing and testing apparatus, for preparing material for betatron radiation and for analysis and interpretation of results. Much inconvenience and waste of time arises from the present arrangement of carrying out these functions to a large extent in the Physics Laboratory and going to the Power Plant for operations with the betatron.
3. The space now used for the betatron will eventually be needed for Power Plant machinery.

A larger and more suitable space is needed. There is no place for the betatron program in thePhysics Laboratory. Neither should it be included in the plans to enlarge the Physics Laboratory for three reasons:

1. The planned betatron development, including the large machine, will require such a large amount of power that it should be near the Power Plant.
2. It is sufficiently difficult to protect persons from the betatron radiations that the laboratory should be in a somewhat isolated region.
3. The electrical disturbance produced by the betatrons would be troublesome to sensitive electrical apparatus in the Physics Laboratory or other nearby laboratories.

III. POST-WAR DEVELOPMENT

The betatron laboratory will become a center of graduate study and research. As mentioned above, there are at least three lines of work that can be very fruitfully exploited with machines of the 20-mev size.

1. High energy physical phenomena and nuclear physics. Three excellent Ph.D. theses by men working with the betatron have been written in this field and the surface is barely scratched.
2. Medical possibilities. It is almost certain from experiments on tissue-like material that for the treatment of deep-seated cancer the x-rays produced by the 20-mev betatron will prove to be definitely superior to the x-rays now available. The fast electrons have even more valuable therapeutic possibilities if they can be brought out of the machine in a concentrated beam. These medical possibilities of the betatron should be vigorously investigated after the war by cooperation of the Physics Department and medical institutions, including our own College of Medicine.
3. Industrial use. The work in this field has been done during the war under government contract and cannot be discussed. It may be said that the applications are such that they will be as valuable in peacetime industry as in war industry.

IV. PROPOSED NEW SPACE

To continue and to expand the fields of investigation two 20-mev machines should be available. On account of the interest in this type of physics it is reasonable to expect that many graduate students and visiting scientists will want to work with the betatron. A laboratory which will accommodate twenty researchers should be provided.

Tentative sketches have been drawn by the Physical Plant Department for a suitable laboratory. The building planned provides:

		Approximate Sq. Ft.
1.	Space for two 20-mev betatrons	1500
2.	Betatron control rooms	300
3.	Ten laboratories, 9 approx $13\frac{1}{2}$ x 24, one 27 x 24	3600
4.	Chemistry laboratory and 3 dark rooms	500
5.	Shop space (machine, glass, instrument)	1700
6.	Three small offices	700
7.	Storage and stock rooms	600
8.	Mechanical equipment and power vault	600
		9500

The total volume of the building is about 220,000 cu. ft., exclusive of the addition for a 250-mev betatron.

The building should be of "shop-type" construction. The interiors should be masonry or tile, the floors concrete or possibly asphalt tile.

Services must be liberally supplied. At each of 20 to 24 stations there should be:

1. Gas and compressed air with 4 to 6 outlets.
2. Water and sink.
3. Permanent installation of 110v. A.C. with 10 duplex outlets; total capacity to station, 50 amperes.
4. Permanent installation for 220 and 110v. D. C. with 4 outlets; total capacity to station, 30 amperes.
5. Two double lines and one triple line to the switchboard for optional services; capacity of each line, 50 amperes.

At some stations there may be variations of these numbers of outlets, or capacity of lines.

The primary power installation should be capable of supplying:

1. 160 k.v.a. 3-phase power direct to the two 20-mev betatrons.
2. 50 k.v.a. single phase 110v. A.C. for permanent laboratory outlets.
3. 10 kw. 220 or 110v. D. C. for permanent outlets.
4. The following power to the switchboard for distribution on optional lines.
   a. 50 k.v.a. 3-phase 220v. A.C.
   b. 50 k.v.a. 1-phase 220v. A.C.
   c. 50 k.v.a. 1-phase 110v. A.C.
   d. 25 k.v.a. 1-phase 0-220v. A.C. controlled by induction regulator.
   e. 50 k.w. 220v. D.C. from motor generator.
   f. 5 k.w. 110v. A.C. 600-cycle from motor generator. The load factor on these installations will be small, say 20%.
5. 20 k.v.a. 3-phase 220v. A.C. to shop.
6. Power for lighting and mechanical equipment.
7. 250-ampere lines from 50 k.w. motor generator to betatron room.

Other items of special equipment which should be mentioned are:

1. Dark room equipment for three photographic dark rooms.
2. Chemistry laboratory equipment, including ventilated hood, chemical table with sinks and gas, air, water.
3. Traveling crane to service the entire betatron area.
4. An elevator (freight-type) to move apparatus between floors.
5. Air compressor.

6. Machine and glass-blowing shop equipment including milling machine, lathes and other machine tools, amounting to $20,000 to $25,000 in total cost.
7. Ten well-built apparatus trucks to move equipment to and from betatron.

It is roughly estimated that the cost of the power installation and the special equipment listed above will be $75,000.

To maintain leadership in the field, every effort should be made to complete plans and obtain funds for the betatron laboratory so that it can be built just as soon as materials are available. Perhaps the building could be completed by the end of the war. Then the facilities would be available for rapid exploitation of the possibilities of the 20 mev machines and the development of the design of the 250 mev machine.

Prepared by Physics Department Building Committee.

PROJECT ENG. 3c

250-MILLION VOLT BETATRON AND BETATRON LABORATORY ADDITION

I. INTRODUCTION

The experiments which have been done with betatrons in the energy range 2 to 20 million electron volts (mev) have already led to results in fundamental physics of the greatest importance and in applications of great promise in medicine and industry. Another whole new field of physics can be opened, if the energy range of this machine is extended to 250 mev or more. This field of high energy phenomena has been available, hitherto, only through the involved and often confusing results of cosmic ray studies. The importance attached to this field can be judged from the tremendous amount of effort and money expended in cosmic ray investigations in the past fifteen years.

If the University is to make the most of its unparalleled opportunity to assume and maintain a strong leadership in the advancement of physics it should ask that a 250-mev betatron be included in the post-war projects of the State. Valuable work can be done with the smaller machines but the greatest interest and importance will be attached by scientists to the high energy phenomena because of their novelty and fundamental nature. The machine was invented at Illinois by Dr. D. W. Kerst. He and his students have the best knowledge and experience to build and work with a big machine. Nothing in physics is so likely to bring prestige to the University and the State as its strong support of a large betatron.

A typical experiment with a large betatron would be to attempt the production of mesons. These particles, which occur occasionally in cosmic radiation, play a fundamental role in present theories of the

structure of atomic nuclei. Their production in the laboratory and the determination of their properties would clearly be one of the half-dozen most outstanding achievements of modern physics.

The method of producing very high energy electrons has been established in the present betatrons which produce electrons of 20-mev energy. If the linear dimensions of the present machine are increased by ten times, electrons of 250 mev capacity can be produced. Improvements in design may make it unnecessary to make the size of the machine proportional to the electron energy but it will be at best a large and expensive installation.

The General Electric Company has built a machine, designed by Dr. Kerst, which will accelerate electrons to 100 mev. This is about the lower limit of the interesting high-energy range. Physicists in other universities have expressed ambitions to build larger betatrons after the war. One is sure to be built elsewhere if the University of Illinois does not successfully promote plans to do so here.

II. COST ESTIMATE

A machine which will produce 250-mev electrons is expensive in first cost and it will require a large amount of power to operate. If the present machine is simply magnified sufficiently to produce 250-mev electrons, the original cost is estimated by Dr. Kerst to be about $1,350,000 and the power consumption 2800 kilowatts. If the points of design mentioned above are successfully developed the cost would be reduced to about one-half, and the power consumption to one-third, of the figures quoted.

III. PROPOSED SPACE

The large betatron would be installed in an addition which is planned for the Betatron Laboratory described in Project Eng. 3b. The addition would consist of a single large area 58 feet by 80 feet with a height of 39 feet. There would be a mezzanine floor covering part of the area and some masonry partitions running part way to the ceiling.

The shops and small laboratories of the betatron laboratory would be used for developing the design of the big machine and later for experimental work with the big machine as well as with the smaller machines.

The construction should be shop or factory type.

The services would include:

1. The necessary primary power installation of 900 to 2800 k.w.
2. A large crane to move heavy objects anywhere in the area.

The volume of the addition is about 190,000 cu. ft., but since it is a single large room the cost per cu ft. should be much smaller than in the usual type of laboratory space. The housing would cost much less than the machine itself. It has no other purpose and should be considered as a part of the 250-mev betatron project.

Prepared by Physics Department Building Committee.

PROJECT ENG. 3d

ENLARGING THE PHYSICS LIBRARY

The physics department library has been primarily a research library, filling the needs of advanced undergraduates, graduate students, and faculty members. Consequently, no books which are not likely to be used for reference have been allowed to remain on the shelves. These have been returned to the Main Library for storage. Only in this way has it been possible to shelve the collection in the very small amount of space available.

In 1938, it was found that there were no longer any books which could be released to the Main Library, and other measures had to be devised. Temporary shelves were built over the fireplace. This provided space for 300 volumes. It was recommended, as a permanent solution, that the central stairway of the building be eliminated and that a room be built there connecting the present library with the seminar room. The Physical Plant Department estimated the cost to be about $5,000. At that time the Librarian approved the project but, for some reason, it was not completed.

In 1939, these shelves could no longer accommodate the necessary books, and a stack unit, with space for 1,000 volumes was secured from the Main Library. This stack has long since been filled.

In 1942, another stack unit, which would accommodate about 700 volumes, was added.

The present rate of expansion is about 300 volumes per year, and there is room on the shelves for only 200 additional volumes. In fact, it would be desirable to have about 200 volumes returned to the department library from the main library if shelf room were available. The shelf space now in place will be filled by next summer.

The only way in which this problem can continue to be solved on a temporary basis is to restrict still further the study space in the library so that only six students can be seated. The present seating capacity is ten, which is totally inadequate. If the seating capacity is restricted to six students, another stack unit, which might meet the expansion needs for the library for another two years, can be installed. Unless new quarters are provided before that time it will be possible to seat so few persons in the library that it may as well close completely, so far as its use as a reading room is concerned.

In 1941, Librarian White considered that the needs for additional space in the physics library was the most urgent of any department library on the campus. This still is true.

Therefore, it is requested that sufficient funds to carry out the plans for enlarging the Physics Department Library be provided. These plans call for the removal of the central staircase on the south side of the first story of the Physics Laboratory, and building a room on the second floor over that area; this new room to be connected to the present library and also, by a doorway, to the present Seminar room. Previous estimates of the cost of this change was $5,000. Presumably they will be somewhat higher, perhaps $7,000 in the post-war period.

Prepared by Physics Department Building Committee

PROJECT ENG. 3e

REPOWERING THE PHYSICS LABORATORY

The need for rewiring and repowering the Physics Laboratory has been recognized for many years; in fact, every year the Director of the University Fire Department gives notice that the wiring in this building is a distinct fire hazard. In 1939, the Physical Plant Department estimated the cost of repowering and rewiring this laboratory at $60,000. This estimate was based on a detailed statement made at that time as to the type of installation desired. Although changes in the details of the plan have been made since then, it is the opinion of Mr. Hinshaw that the figure given as a crude estimate in 1939 is still approximately correct.

Not only is the wiring in this building a fire hazard, but it is totally inadequate to supply the present needs for research, instruction, and lighting. No doubt the demand will be increased in the post-war period. The wiring has not been modernized since the building was built approximately thirty years ago. Obviously, at that time the designers of the building could not be expected to know present-day needs. From time to time, temporary and auxiliary installations have been made, but they have not been coordinated, or installed in a completely satisfactory way. Much of the insulation on the old wire is bad, as has been discovered at various times when necessary repairs had to be made.

It is requested that a sum of $60,000 or $70,000 be included in the building program so that a modernization of our electrical power system in the Physics Laboratory may be achieved at the earliest possible date.

Prepared by Physics Department Building Committee

PROJECT ENG. 4a

MINING AND METALLURGY BUILDING

I. INTRODUCTION

In a recently published history of the Department of Mining and Metallurgical Engineering at the University of Illinois it was pointed out that the second meeting of the Board of Trustees held in May 1867 approved a report of the Committee on Course of Study and Faculty, providing for courses in Mining Engineering and Metallurgy. In the period 1867-93 instruction in mining engineering was carried on in various buildings on the College of Engineering campus. In August 1893, the University discontinued the curriculum in mining engineering.

In 1908 interest in mining was revived and on April 1, 1909, Senate Bill 384 and House Bill 538 were introduced to the Senate and the House. The bill passed the General Assembly and on June 8, 1909, was signed by Governor Deneen. The Act established the Department of Mining Engineering at the University of Illinois, and instruction was begun in September 1909. During the first two years the department was scattered about the Engineering campus and had offices, classrooms, and laboratories in the following buildings: Physics, Engineering Hall, New Power Plant, Chemical Engineering, and Locomotive Testing Laboratory.

In 1911 an appropriation of $25,000 was made for additional equipment but the fund was utilized in constructing a new mining laboratory which was completed in the fall of 1912. The laboratory contained approximately 8,000 sq. ft. of floor space, and provided for sampling and grinding, chemical and physical testing, coal preparation and ore dressing, ventilation and drilling, and blasting. There were no provisions in the building

for housing the staff of the department. In the fall of 1912, the new Transportation building had been completed, and space was provided at the south end of the second floor of the new building for the staff of the Mining Department. Departmental and staff offices, classrooms, and drafting rooms were housed in the Transportation building until the fall of 1941 when new quarters were established on the third floor of the Ceramics building in space vacated by the State Geological Survey.

In 1914 an addition was approved for the Mining Laboratory but money was never appropriated and the additional wing was never built. As early as 1916 the Head of the Department recommended the construction of a building to house the offices and laboratories of the department, and this recommendation stated that a total of 70,000 sq. ft. of space would be needed. Excepting for an appropriation of approximately $7,000 in 1941 for reconstructing the mineral dressing laboratory, no other effort has been made to bring the work of the department under one roof and to provide adequate quarters.

The University catalog for the year 1933-34 carried the first announcement of the new curriculum in metallurgical engineering. An appropriation of $50,000 was secured in 1935 for the construction of a metallurgy laboratory. Construction was completed and the building was occupied in the second semester of 1936-37. The building consists of an addition to the east of the Mining Laboratory, is two stories high, and has a floor space of approximately 8,000 sq. ft. The new Metallurgy Laboratory provided office space for two staff members, and the laboratories were estimated to provide for an enrollment of 50 students.

At the present time, the department is divided between three buildings: Ceramics, Mining Laboratory, and Metallurgy Laboratory. At no time in the history of the department has it been housed under one roof so that the staff, laboratories, and classrooms were combined as a single unit.

Another consideration that should be taken into account is the fact that the departmental laboratories have always been located behind other University buildings, and have not been readily accessible. The mere fact that the laboratories have always been hidden within a group of other buildings may have had some bearing on the student enrollment. Consideration should be given to the location of a new building fronting a street of easy access so that the public may realize that a major Department of Mining and Metallurgical Engineering exists on the campus.

II. DEPARTMENT LOAD

1. Instructional Load. The following table shows the contact hours for each member of the staff for the school year 1940-41:

Instructor	Contact Hours 1st Sem.	Contact Hours 2nd Sem.	Subjects Taught 1st Sem.	Subjects Taught 2nd Sem.
H. L. Walker	10 lec. 9 lab. 19	11 lec. 3 lab. 14	4	4
H. P. Nicholson	12 lec. 4 lab. 16	10 lec. 11 lab. 21	5	6
J. L. G. Weyser	9 lec. 9 lab. 18	10 lec. 7 lab 17	3	6
E. J. Eckel	6 lec. 12 lab. 18	4 lec. 18 lab. 22	2	3

Continued on following page

Instructor	Contact Hours 1st Sem.	Contact Hours 2nd Sem.	Subjects Taught 1st Sem.	Subjects Taught 2nd Sem.
B. G. Ricketts	10 lec. 3 lab. 13	8 lec. 9 lab. 17	2	2
J. A. Snyder	7 lec. 13 lab. 20	---	3	---
G. W. Dickinson (half time)	12 lab. 12	9 lab. 9	1	1
W. H. Bruckner (full time research)	Graduate & undergraduate research		2	2

The above table indicates that the instructional load and contact hours are not only high but that in some cases the number of different subjects taught is as high as six, which is at least twice the number of subjects that an instructor can properly prepare.

The following table shows the department enrollment for the period 1934-41:

1934 - 24	1938 - 97
1935 - 34	1939 - 130
1936 - 45	1940 - 132
1937 - 69	1941 - 138

The figures show a six-fold increase in student enrollment in an 8-year period. Furthermore, there is no reason to believe that student enrollment has reached a saturation point as a continued increase is to be expected in the postwar period. The number and extent of metallurgical industries in Illinois and nearby states can very easily absorb a considerably greater number of graduating students each year. In addition, the present war has tended to accentuate the importance of well-trained metallurgists in the metal manufacturing industries, and the publicity given in the press and radio has tended to create a livelier interest in this engineering field.

The mining industries of the state are showing an increased interest in securing young mining engineers as shown by the fact that they have established 12 scholarships in mining engineering in the two years preceeding the commencement of war. Other coal companies have indicated their interest in establishing scholarships in mining so that they may have available each year young engineers to add to their staff.

At the time the Metallurgy Laboratory was constructed in 1937, there were three full-time instructors and one full-time research man on the staff of the department. In 1941 there were six full-time instructors, one half-time assistant and one full-time research man.

There does not seem to be a good criterion for estimating the probable increase in student enrollment in the postwar period; however, statistics on student enrollment in mining and metallurgical engineering for the approved schools in the United States indicate that enrollment should be further increased. The student enrollment in mining and metallurgical engineering in the period 1934-41 for the United States was as follows:

1934	-	2098
1935	-	2463
1937	-	3282
1939	-	4295
1941	-	4488

There will be an immediate need for a staff increase of one full-time instructor and two half-time assistants to take care of enrollment equal to that which prevailed in 1941, and which it seems we are justified in expecting to be equaled and probably exceeded at the immediate conclusion of the war.

Any consideration of new building space should recognize the desirability of establishing a service course in the heat treatment of metals in this department. It is proposed that the foundry and courses in foundry practice, and that the option in petroleum engineering be transferred to this department. The heat treatment of metals course will have a high enrollment because of the large number of students enrolled in Mechanical Engineering, and the floor space available in our present laboratory is inadequate. The foundry which was constructed in 1902 is inadequate for proper student instruction, research, and the making of castings for the University. A new building with equipment should be provided.

2. Research Activity. For the past five years the department has maintained cooperative research programs with various governmental agencies, and in addition it has promoted and carried on research problems of its own interest. The expansion of cooperative research in the future will depend upon securing additional staff, space, and facilities. We are limited to our present activities because of limitation of staff, equipment, and laboratory space. We are frequently called upon to give advice and consultation to the industries and public of the state of Illinois in problems concerning the proper use of, the cause of failure of, and the analysis of metallurgical materials. This activity seems to be a worthwhile one, and should be continued and expanded.

III. PRESENT SPACE

1. Mining Laboratory. There is a net floor area of approximately 9,000 sq. ft., of which about 4,000 sq. ft. is usable. The building was constructed of brick and wood in 1912. Approximately one half of the

floor area was repaired and reconstructed in 1941. The remainder of the floor area is limited in its use because the interior wood construction constitutes a serious fire hazard for any furnace work. The use of the space is now limited to fuel analysis. With the construction of new space for mining laboratories there does not seem to be any possibility for the utilization of more than half of the present space, and it is proposed that the mining laboratory be abandoned. The portion which was repaired in 1941 could be used for research in coal preparation and the development of domestic stokers for coal combustion. This research program would depend upon securing a suitable appropriation.

2. Metallurgy Laboratory. There is a net floor area of 8,000 sq. ft., constructed in 1937, of brick and tile with concrete floor. The present quarters are inadequate because the student enrollment has increased to approximately twice that for which it was designed, and only three laboratories were originally provided. Two offices were originally provided in the laboratory but there are now four staff members housed in the building. Only one classroom was provided, and as a result our classes have been conducted in a number of buildings because they could not be scheduled in the laboratory in a single classroom. Our metallographic laboratories have limited the size of sections which could be scheduled and have unnecessarily increased the instructional load because of the number of sections involved. The furnace laboratory should be separated from offices, classrooms, and other laboratories.

It is proposed that after the construction of a new building for the department the Metallurgy Laboratory be used for research space as a part of the Engineering Experiment Station.

3. Ceramics Building. This department now occupies eight rooms and hall space, totaling approximately 3,000 sq. ft. This space is being used for staff offices, general departmental offices, class, and design rooms. It is proposed that the space be released to the Ceramics Department after construction of a new building.

4. Postwar Development. The departmental plans for a postwar development indicate an expansion in the curricula, expansion of student enrollment, expansion of research activities, and an expansion in courses offered to other departments in the College of Engineering. It is also planned to incorporate the activities of the foundry, the petroleum engineering option, and the heat treatment of metals laboratory for the Mechanical Engineering Department. All three of these activities are logically a part of the activities of Mining and Metallurgical Engineering.

The instructional loads carried by the staff have already been shown to be excessive, and it is proposed that our staff be increased as follows:

Two full-time instructors, and two half-time assistants in metallurgy. (One full-time instructor should be available from Mechanical Engineering.)

One full-time instructor in mining.

Two full-time instructors, and one full-time assistant to operate the foundry. (These should be available from Mechanical Engineering.)

IV. PROPOSED NEW SPACE

For the past year the staff members have been studying the needs of the department, and have prepared preliminary floor plans which we believe are required to carry on the activities of the department as they

existed in 1941, and including the anticipated increase in enrollment in the years immediately following the war. The proposed net floor area is 38,500 sq. ft. The building should be of brick and concrete, and fireproof because of the nature of the work.

The most logical location for the new building seems to be on the south side of Springfield Avenue between Mathews and Goodwin. It seems desirable to keep all activities of the mineral industries, such as ceramics, mining, metallurgy, petroleum, and possibly geology, in as compact a unit as possible.

The following special services will be required in the new building:

a. High and low pressure gas for furnaces.

b. Compressed air for gas combustion.

c. A.C. and D.C. electricity, the A.C. line to be of high amperage capacity for experimental furnaces.

d. Water supply of constant head for mineral dressing experiments.

e. Dust collection system for metallographic grinding room.

f. Fume hoods with forced ventilation for electrometallurgical, chemical, and furnace rooms.

g. Photographic dark rooms for metallographic and research laboratories.

h. Water supply to practically all laboratories.

The type of proposed building construction includes the provision for an additional wing to the west of the building to provide space for petroleum engineering.

V. SUMMARY

1. Construction of a new Mining and Metallurgical Engineering Building with approximately 38,500 sq. ft. of floor space.

2. Abandon the present Mining Laboratory, or at least one half of the laboratory and use the remaining half for research in coal.

3. Release the present Metallurgy Laboratory to the Engineering Experiment Station for cooperative research.

4. Release the space now occupied in Ceramics Building to the Ceramics Department.

5. Include the Petroleum Engineering option in the Mining Engineering curriculum.

6. Adjustments in staff will be required to serve the expanded department.

Prepared by H. L. Walker
Head of the Department

PROJECT ENG. 4b

FOUNDRY LABORATORY

In addition to the Mining and Metallurgy Building, that department needs a foundry in the immediate neighborhood of the new building, but separated from it. It is desirable to have the foundry separate because of the large amount of dust and fumes to be found in foundry operations. The required floor space will be approximately 5,000 sq. ft. It has already been proposed that the present locomotive testing laboratory, which is now being abandoned, be used for a Foundry. This building has a high ceiling and an overhead crane, and pouring pits are essentially already in place. It is believed this building could be reconstructed to adequately take care of a foundry though no definite plans have been made to determine its usefulness. If this building should be used for some other purpose or should prove to be inadequate in floor space, then it would be necessary to construct a new Foundry Building in the immediate vicinity of the proposed Mining and Metallurgy Building.

The Foundry would include a cupola for melting cast iron and at least two types of furnaces for melting steel. There would have to be provided equipment for molding and sand conditioning, a cupola furnace, and a gas- or oil-fired steel melting furnace. In addition, there would be required a number of small items incident to the operation of a foundry. A comparatively large amount of the required equipment should be available from the present foundry.

Prepared by Professor H. L. Walker,
Head of the Department

PROJECT ENG. 5

SPACE FOR GENERAL ENGINEERING DRAWING

I. INTRODUCTION

In considering the "post-war" building program of the University, there should be taken into account the needs of the General Engineering Drawing Department, both for additional space and the renovation of some space in which the Department is partially quartered in the Transportation Building. These needs have been sharply manifest during the last ten years and they will be even more apparent in the post-war period.

No new buildings or additions are suggested in order to properly house the Department. What is contemplated is a more complete use of the Transportation Building, thus requiring the Mechanical Engineering Department to give up space which it occupies in the building to a large extent, thus in turn, making it important that new space be provided for that Department. The space needed by the Drawing Department is largely in the form of drafting rooms although the Department must also have several more offices than it now has if post-war enrollments return to anything like those prevailing just prior to Pearl Harbor. In effect, the need is for all of the space now used by machine design classes amounting to three drafting rooms and several offices.

Renovations will consist mainly of new lighting for several drafting rooms now very poorly lighted, which in turn will require new lead-in lines to the building. These improvements have already been contemplated and provided for in at least one previous budget, but could not be carried out on account of other more pressing emergency conditions arising as a result of the war. A few partition removals, blackboard installations, and other minor improvements are necessary to equip the building so that it would completely house the Department which now used and has for some time used two other buildings for its purposes, namely, Ceramics Building and Engineering Hall.

The following is an elaboration of the foregoing general statements and a citation of the most important facts to be considered in appraising the real situation which the Department faces in respect to inadequate housing facilities.

II. DEPARTMENT LOAD

Enrollments in Departmental courses have steadily increased with the growth of the College of Engineering and other divisions of the University enrolling students in drawing, particularly Chemical Engineering, Architecture, and Art. Post-war influences are bound to raise the enrollment higher and higher under the influence of increased interest in Aeronautical Engineering, vocational and semi-vocation programs for veterans, and the general impetus which the war has given to engineering training. All these programs will bring increased enrollments in the Drawing Department.

III. PRESENT SPACE

The Department now controls seven standard size drafting rooms each accomodating twenty-four students at a time or ninety-six a week, and shares one with the Mechanical Engineering Department which itself controls three more in the Transportation Building. The Department also has available for models and small special classes, one other drafting room under its control. These rooms, together with the necessary class rooms and offices, are located in three floors of the building. Blueprint and other service rooms are located in the attic of the building.

In addition to the above nine rooms, the Department uses one drafting room in the Ceramics Building and one or two rooms in Engineering Hall. These rooms are very inconvenient from the standpoint of use of department models, blueprint, photostat, and other demonstration equipment of the Department.

IV. POST-WAR DEVELOPMENT

As previously stated, an increase in enrollments in the Drawing Department far beyond any experienced in the past can be reasonably expected. Every increase of one-hundred students requires an additional drafting room, part of a class room, and office space for one and one-third instructors. These rooms should be located around and near the common service equipment of the Department; just as equipment rooms, drafting rooms, and offices should be housed in a surveying building. The three drafting rooms in the Transportation Building used by the Mechanical Engineering Department and one or two rooms to be formed by partition removals are certainly needed by the Drawing Department. This arrangement can be consummated only if space is provided for Mechanical Engineering Design in new quarters.

V. PROPOSED NEW SPACE

No major expense is involved in providing this new space for the Department of General Engineering drawing. Most of the space to be used is now well arranged except for lighting. Partition removals are involved in providing new drafting rooms in the building. The Mechanical Engineering Department was, just prior to the war, in a position where such remodeling was contemplated. It would have been absolutely necessary if the Drawing Department had not taken its work elsewhere.

VI. SUMMARY

The foregoing can be summarized in two brief sentences: (1) The Department of General Engineering Drawing should be housed in one building, namely, the Transportation Building, and (2) New space for the design division of the Mechanical Engineering Department should be provided elsewhere, preferably in a new building.

Prepared by Dean H. H. Jordan
Head of the Department

PROJECT ENG. 6

AERONAUTICAL ENGINEERING BUILDING

In planning the post-war building program, consideration should be given to the need for providing building space for the program in aeronautical engineering which is about to be inaugurated.

A definite statement concerning the requirements cannot be made at this time because these will depend upon the type of educational program which is adopted. If this program should consist of undergraduate options in aeronautics in the Mechanical, Civil and Electrical Engineering curricula with graduate work in Aeronautical Engineering, the space requirements would not be as large as they would be if a Department of Aeronautical Engineering is set up with an undergraduate curriculum and graduate courses. In either case, provision should be made for a research program which is quite certain to be extensive.

An appropriate amount for consideration at the present time is $500,000. This would provide for the more extensive program. Future developments might indicate that a smaller amount would be adequate.

Prepared by M. L. Enger
Dean of the College of Engineering

SECTION 6

PROJECTS PROPOSED BY

THE COLLEGE OF FINE AND APPLIED ARTS

SECTION 6

PROJECTS PROPOSED BY

THE COLLEGE OF FINE AND APPLIED ARTS

GENERAL COMMENTS

The College of Fine and Applied Arts needs relief in two general areas:

1. Adequate housing for the departments of Art, Architecture and Landscape Architecture.

2. More space in Smith Memorial (Music) Hall.

In order to achieve the first objective, it is proposed to vacate space now used by the Art Department in the Architecture Building and five other campus structures, asking for a new Fine Arts Building to be erected north of the Architecture Building and designed to house the rapidly growing Department of Art and the various gallery collections and provide such needed space for the crowded Ricker Library and room for a reasonable growth of these interests.

This will vacate space in the Architecture Building which will then provide housing for:

1. The Department of Landscape Architecture to be moved from the New Agriculture Building.

2. Housing for the Bureau of Community Planning, now in basement space in the Commerce Building.

3. Expansion for Architecture including such items as a commons room, a museum of building materials, additional office space, and a graduate seminar.

In order to achieve the second objective, an addition is proposed at the west of Smith Memorial Hall to provide much needed library space, more studios, more practice rooms, an archestra rehearsal hall, locker space and other facilities.

Prepared by College Committee on Buildings: Rexford Newcomb, Chairman
O. G. Schaffer
F. B. Stiven
J. G. Van Derpool

SUMMARY OF PROJECTS

PROPOSED BY

COLLEGE OF FINE AND APPLIED ARTS

Number		Net Floor Area	Page
F.A.A. 1	Fine Arts Building.	65,000 sq. ft.	3
F.A.A. 2	Space for Department of Landscape Architecture.	8,000 " " (a)	10
F.A.A. 3	Space for Bureau of Community Planning.	1,000 " " (a)	12
F.A.A. 4	Addition to Smith Memorial Hall	30,000 " "	13

(a) To be provided for in present Architecture Building

PROJECT F.A.A. 1

FINE ARTS BUILDING

I. DEPARTMENT LOAD

In 1931 when the present housing for the Department of Art was provided, the total enrollment was 59 full-time professional students. Prior to that time the Department was offering only service courses and did not offer a degree curriculum or an art major. Since then, a great expansion has occurred. Four options in Art have been formed leading to the Bachelor of Fine Arts degree after the completion of 130 semester hours of professional training, namely:

Four-year option in Art Education

Four-year option in Painting

Four-year option in Industrial Design

Four-year option in Commercial Design

The enrollment has increased to 236 professional students in the four options and an additional 300 non-art students taking some work in art. The faculty has increased from five to eighteen full-time members. The housing adjustments necessary to accommodate this large increase have been effected by using any space available on the campus without consideration of its fitness. Important departmental courses are given in six different buildings scattered from the north to the south ends of the campus, utilizing a fourth-floor drafting room in Engineering Hall, third floor space in Lincoln Hall, the storage basement and other space in Civil Engineering Surveying Building, the south basement of Commerce Building, the private dwelling known as Mumford House, and such space of the Architecture Department as we might secure even though as many as three other classes were simultaneously using that space.

Faculty office space has been similarly scattered. Working conditions have often been most adverse. A point has been reached where it seemed necessary to refuse service courses to other university departments, although we are eager to be as broadly useful as possible.

The growth of the department is still in an early stage of possible development. The minimum of two additional curricula, i.e. Interior Design and General Fine Arts, and graduate work in each existing option are needed in the light of the large number of requests received.

II. PRESENT SPACE

The space assigned the Art Department in the present Architecture Building and the additional space in that building which, while assigned to architecture or exhibits, is being used for Art classes, covers a net total of approximately 22,220 square feet. This building was begun in 1926 and first occupied in 1928. It is of fireproof construction, reinforced concrete, brick walls and limestone trim, with slate roof and hollow-tile partitions.

The modeling, sculpture, and ceramics studio is located in the south basement of the Commerce Building, which is of similar construction, and totals approximately 2300 square feet. The office and Art Education studio space in Lincoln Hall, which is good, but less modern and less fireproof, covers approximately 2300 square feet. The Civil Engineering Surveying Building, where space for industrial design, materials shop and crafts laboratory is provided, is an old building, constructed originally as a horticulture field hours, and is in need of extensive renovation. The first-floor studio is useful but entirely too small for even normal registration. The industrial design materials shop and crafts studios in the basement are distinctly sub-standard in every way and were not originally intended for

other than fruit and vegetable storage. The four rooms in the building cover approximately 2088 square feet. The power lines running into it are inadequate for the loads, walls are either painted or unpainted brick and only small cellar windows give light in the basement rooms now in use. Engineering Hall, Room 342 and the nearby office have been of great assistance to us in providing approximately 1,744 square feet of useable space, but the lighting conditions are different for studio purposes.

Mumford House, which is scheduled for early demolition, has about 1,420 square feet of floor space but can be used in only a limited way because of the small rooms. It has worked well as a center for the Visiting Professor of Art but is not suitable as a classroom building.

The present Art quarters in the Architecture Building are so drastically short of the needs that a new building should be urged to house completely the work of this department, thus releasing all the space in the six buildings for other university needs.

Other reasons why present quarters are inadequate are:

1. Supervision of classes is most difficult under present conditions.
2. Architecture and other departments are placed at a disadvantage by Art encroachment on their space.
3. Commercial Design has no quarters of its own. A point has been reached where any additional students would have to be placed in the corridors.
4. Industrial Design instruction is given under very cramped conditions. The shop is a basement storage room.
5. Crafts given in basement of the Civil Engineering Surveying Building in quarters devoid of daylight, and woefully inadequate in space in view of greatly expanded present and proposed needs. Occupational Therapy students use this room under the worst professional conditions.
6. No space for graphic arts instruction -- lithography, etching, engraving.
7. Studio space in general is seriously limited. Several classes meet simultaneously in same room.

8. Limited lecture facilities and wrong type -- need sound both, etc.

9. No space available for new work that should be given.

10. Now use rooms where light conditions are impossible (Rooms 10, 20, 4 and loges) in Architecture Building.

11. Several faculty members now have offices in space designed for storage.

12. No space for permanent display of collections.

13. No seminar room.

14. Limited storage facilities for equipment.

15. Library reading room half needed size.

16. Stacks have long been inadequate -- books stored in trucks, etc.

17. No print room for study and housing of print collection.

18. No adequate space for slide collection.

19. No adequate work room for library staff.

20. No offices for librarians.

III. POST-WAR DEVELOPMENT

Every indication points to a period of considerable expansion for this department.

1. Industrial design is a relatively new profession in this country. The post-war period will make great demands on this profession for the design of new manufactured goods and application of new materials that only the qualified industrial designer can supply.

2. A curriculum in interior design has been sorely needed. More requests come in from students desiring training in this field than any other not now offered.

3. A curriculum in general fine arts is one that we should offer as soon as possible.

4. Art Education stands in great need of further development. We have the opportunity to make an important educational contribution to the whole central region of this country in this field.

5. Graduate work in at least two of our four existing options is definitely needed and consideration should be given to a graduate program in the remaining two options.

6. It appears that the following five staff members will need to be added:

   a. Additional professor of art education

   b. Interior design specialist

   c. Crafts instructor

   d. Resident painter

   e. Graphic arts instructor

IV. PROPOSED NEW SPACE

The proposed new building for the Art Department should include space for housing our important art collections, known as the Merle J. and Emily N. Trees Collection, the Ewing Collection, the Meyers Collection, the College Collection, and others. The construction should be fireproof and related in type to the Architecture Building. The area for permanent exhibits should be air-conditioned, a passenger elevator is needed and compressed air and gas connections should be available in studios and laboratories. The building should be connected to the present Architecture Building on the north so as to provide north-lighted art studios and allow for an addition to Ricker Library. The north facade should face the south front of the University Library.

A summary of the net floor areas needed, exclusive of corridors and services, follows:

Studio space	27,930 sq. ft.
Exhibit space	14,456 " "
Lecture space	4,918 " "
Office and private studios . . .	7,436 " "
Storage and locker space	5,436 " "
Commons — studio	1,900 " "
Library stacks, etc. (addition to Ricker Library)	3,500 " "
Total new space needed . . .	64,576 sq. ft.

The construction of the proposed Fine Arts Building would free, for other purposes, the space listed as follows:

In Architecture Building (This includes space used by the Art Department but not regularly assigned to it) . . .	22,220 sq. ft.*
In Commerce Building, approx. . .	2,300 sq. ft.
In Lincoln Hall, approx.	2,300 " "
In Civil Engineering Surveying. .	2,088 " "
In Engineering Hall, approx. . .	1,744 " "
In Mumford House, approx.	1,420 " "
Grand total of net space that could be released . .	32,072 " "
Grand total of net new space needed	64,576 " "

* Note: This total is actually considerably smaller because this space is jointly used with resulting over-crowded conditions and confusion. The space actually vacated by Art is about 14,000 sq. ft. The balance, or 8,220 sq. ft. belongs to the Department of Architecture, is in constant use, and could not be freed. Much of this 14,000 sq. ft. is not good space and should in no case be used for classrooms or offices.

V. SUMMARY

The erection of a Fine Arts Building would clear up the following housing difficulties in the College of Fine and Applied Arts:

1. House all work of the Department of Art in one central area.
2. Provide for the envisioned growth in the Department of Architecture.
3. Provide housing for the important collections now in hand and provide reasonable space for future acquisitions.
4. Provide much needed expansion for Ricker Library.
5. House Landscape Architecture in the Architecture Building (Project F.A.A. 2)
6. House the Bureau of Community Planning in the Architecture Building (Project F.A.A. 3).

Prepared by College Committee on Buildings

PROJECT F.A.A. 2

SPACE FOR DEPARTMENT OF LANDSCAPE ARCHITECTURE

I. INTRODUCTION

The Department of Landscape Architecture has occupied practically the same space in the New Agriculture Building for eighteen years although some rearrangement of this space has been made. The only addition has been space for a modelling room. So far as can now be predicted, the enrollment will require space about equivalent to that now available. This should be ample for several years.

II. PRESENT SPACE

Present space consists of two drafting rooms, four offices, library stack room and reading room, fireproof vault, seminar room, etc. The total net floor space is approximately 7,000 square feet and is adequate, but suitable student lockers have not been available. When present space is vacated, it will be used by the College of Agriculture which has been wanting it for several years.

III. POST-WAR DEVELOPMENTS

Present plans contemplate the addition of a Construction Option in the undergraduate curriculum, and graduate work in Landscape Architecture and Regional Planning. Plans have been developing for making these changes for several years and it is expected that post-war programs of private and public works will demand that students be prepared under them. An additional instructor will be needed when these changes are instituted.

IV. PROPOSED NEW SPACE

It is hoped that the Department of Landscape Architecture can be quartered in the Architecture Building in space as good as its present quarters. Some provision should be made for reasonable growth.

V. SUMMARY

Provision should be made for about 8,000 square feet of space as follows:

Drafting rooms	3,000	sq.	ft.
Modeling rooms	1,000	"	"
Seminar	1,000	"	"
Offices	1,200	"	"
Storage and File room	500	"	"
Expansion (including display space, museum, etc.)	1,300	"	"
Total	8,000	"	"

This does not include library space as it is proposed to combine the Landscape Architecture Library with Ricker Library and find room for it in the expansion provided under Library.

Prepared by College Committee on Buildings.

PROJECT F.A.A. 3

SPACE FOR BUREAU OF COMMUNITY PLANNING

It is proposed to move the Bureau of Community Planning from the Commerce Building into the Architecture Building. The Bureau will need space as follows:

Offices	250 sq. ft.
Drafting room	300 " "
File and Conference	300 " "
Storage	150 " "
Total	1,000 " "

Prepared by College Committee on Buildings.

PROJECT F.A.A. 4

ADDITION TO SMITH MEMORIAL HALL

I. DEPARTMENT LOAD

There has been no increase in space in Smith Memorial Hall, occupied by the School of Music, since the building was completed in 1921. However, recent revisions in space, like the conversion of the memorial room into a temporary library and the conversion of the former library quarters into studios have rendered the building more usable.

When the building was first occupied in 1921, the enrollment was 101. The School was placed in the College of Fine and Applied Arts in 1931. The enrollment gradually increased to 206 students just before the war. During this time, the faculty was correspondingly increased. Except for minor changes noted above, no teaching space has been added. The saturation point has been reached.

There is every indication that there will be a decided influx of men students following the war, so that the registration will be larger than ever before. The above observations do not take into consideration students from other colleges who come to the School for courses in Music. This number reached 356 the last semester just before the war.

II. PRESENT SPACE

The net floor area of the room space in the Music Building is approximately 20,000 square feet, exclusive of the Recital Hall and hallways. The building is of fireproof construction. The sound-proofing; the acoustical treatment; the ventilation, particularly of the third floor; and the humidity of the air leave much to be desired. Otherwise the building is satisfactory. It is splendidly kept up.

The respects in which present quarters are inadequate are:

1. Departmental Library.--The present remodeling to make use of the Memorial Room as a Music Library can be considered only as a temporary expedient. Less than half of the books, and only a small part of the music, can be accommodated in this room, in the newly-built closets and in the room under the balcony.

2. Orchestra Rehearsal Room.--The present makeshift room in the south basement is too small, of unsatisfactory shape and poor from the acoustical standpoint.

3. Third Floor Lecture Room.--This is the only large room in the building that can be used as a classroom and it is impossible to use it when the organ in the Recital Hall below is being used. This makes the room unusable much of the time, since the organ is used for lessons and practice most of the day.

4. Recital Hall.--This beautiful room, with a seating slightly over 1,000, has never been correct from the acoustical standpoint. It is far too resonant. Moreover, it is too large for School of Music student recitals and other concerts not open to the public.

5. The Lack of Locker Space.

III. POST-WAR DEVELOPMENT

The prospective increase in staff and student body will necessitate more classrooms, studios and practice facilities. No new curricular plans, other than some contemplated new courses, are proposed.

IV. PROPOSED NEW SPACE

1. General Comments.--The location of the proposed new space would be in an addition on the west side of the present building, an arrangement which

was originally planned by the architect. The net floor area, including Concert Hall and Library, and extending three floors and basement, ought to be about 30,000 square feet.

This new space should include a Departmental Library, a small concert Hall, seating 400 to 500, an Orchestra Rehearsal Room, two or three classrooms, eight to ten studios, piano and organ practice-rooms, listening rooms, locker space.

Special consideration should be given to sound-proofing, air humidifying, air-conditioning and acoustical treatment, both in a proposed new addition and in the present building.

2. Space Requested to Relieve Present Congestion:

a. More Studios.--As was mentioned above, four studios are at present occupied by two teachers each. The Broadcasting Studio is used by a teacher, with resultant conflicts in the use of the room.

b. More Practice Rooms.--Before the war-time decline in enrollment, the practice rooms were completely scheduled for practically the entire day and to a considerable extent in the evening.

c. The Library.--This present plan for the Library, which is just being put in operation, is admittedly inadequate for the purpose, but will serve until better accommodations can be secured, which can be obtained only by an addition to the building.

3. Space Required for Future Expansion:

a. Studios

b. Practice Rooms

c. Listening Rooms

d. Classrooms

e. Addition to Director's Suite.--There will be need for additional space at some time in the future for a remodeling of the Director's Suite, to provide more room for stenographic help, for filing space and for accommodations for an Assistant Director. This could be accomplished without difficulty by utilizing the present classroom, No. 106.

f. Small Concert Hall.--This is to be used also as Lecture Room, rehearsal room for Glee Clubs, etc.

g. Orchestra Rehearsal Room.

h. Museum (Memorial Room)

V. FUTURE DEVELOPMENT

The future development of the School of Music will be in expansion in numbers in the undergraduate work and in the increase of emphasis on the graduate work in music and music education. A constant increase during the past few years in subjects in music taken by students from other colleges of the University will also probably continue to an even greater extent.

VI. SUMMARY

At the time the Smith Music Hall was first occupied, most of the studios and approximately three-quarters of the practice rooms were used. The faculty then numbered about half of the present number and the student body was about half our registration just before the war. There is no doubt but what more space will be needed in the near future if the School of Music is to continue to hold its place among the important schools of its kind in the country.

Prepared by College Committee on Buildings.

SECTION 7

PROJECT PROPOSED BY

THE COLLEGE OF EDUCATION

PROJECT 7

PROJECT PROPOSED BY

THE COLLEGE OF EDUCATION

GENERAL COMMENTS

In a meeting with President Willard and the University of Illinois Building Program Committee on May 18, 1943, the Committee on Building Program of the College of Education renewed its request for a building to serve as a laboratory for research and instruction related to the growth and development of children and youth. The college committee recommended that this building include a nursery school, kindergarten, elementary school, and high school and other laboratory and clinical facilities, as well as the offices, classrooms and other facilities of the College of Education, and appropriate facilities for the use of other University departments interested in the study of the growth and development of children and youth.

The University Building Program Committee asked whether the provision of laboratory school facilities had been established as University policy. In answer to this question the following facts are reported:

On April 18, 1910, the University Senate voted:

"(1) That the Academy be discontinued after June 1912.

"(2) That in place of the Academy there be established a training, experimental and observation school of secondary grade which shall serve as a laboratory of the School of Education under the control and direction of the Department of Education."

The recommendation that the school be of "secondary grade", which as shown by the building plans was interpreted by the University to mean a junior and senior high school, resulted from the contention of the normal schools that the University of Illinois should not enter the field of elementary education. During recent years, however, discussions with the five state teachers colleges have brought acceptance by them of the appropriateness

of provisions for research and teaching with regard to the elementary school at the University of Illinois. This acceptance was expressed in a recommendation concurred in by the five state teachers colleges that the University of Illinois appoint a committee to plan for the development of a five-year program for the education of elementary teachers on the Urbana campus. The growth and development of children of one age group cannot be adequately studied in isolation from study of earlier age groups. It is, moreover, the special function of the University to educate administrative officers and other educational leaders, including college and university faculty members, who will deal with problems of elementary education.

The Leland Survey conducted in 1942-43 for the State Department of Finance stated: "The University of Illinois is obviously the logical state institution in which to develop the continuation program (beyond the four undergraduate years) for elementary teachers. It should be given needed support for the development of a strong department in this field."[1] The Survey stated also, "At the present time, it (the University of Illinois) lacks adequate facilities, including a demonstration school, for thorough work in elementary education."[1]

As a result of the recommendation of the University Senate adopted on April 18, 1910, the Trustees of the University of Illinois on October 15, 1910, adopted the following recommendation: "That the Trustees of the University ask the next Legislature for the sum of $250,000 for the erection of a separate building for the School of Education which shall also contain provision for the model high school recommended by the Senate and endorsed by the Committee".[2]

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1 From "Report on Teacher Education by State-Supported Institutions in Illinois," William S. Gray, Department of Education, University of Chicago, p. 17. (Undated).

2 Memorandum on the History of the Building Program for the College of Education prepared by President's Office.

Even before the Board of Trustees' action referred to above, the University had accepted the phrase "laboratory school". W. C. Bagley, Director of the School of Education in 1910, writes that an early published report of experimentation carried out in the Academy " . . . was listed as, 'from the Laboratory of the School of Education, University of Illinois' ". He goes on to say, "I clearly recall that I secured the permission of President James for so designating the Academy."[1]

On January 29, 1937, President Willard presented to the Board of Trustees a report from a special committee of the University Council on a long term building program for the University. A summary of this report states that it redommended ". . . under a suggested building program arranged by bienniums beginning July 1, 1937, that during the 1941-43 biennium the first unit of a College of Education building be constructed and that during the 1945-47 biennium the College of Education (second unit) be constructed."[2] Exhibit D of this report states: "For purposes of training teachers, superintendents and principals and for experimental purposes it is necessary to have nursery, kindergarten, grades one to six, and also junior and senior high school instructional facilities."[3]

In a letter, dated February 15, 1944, to the chairman of the University Building Program Committee, Dean R. R. Hudelson as chairman of the Committee on Future University Programs stated that:

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1 Quoted from a letter from Professor W. C. Bagley to Dean Benner, dated May 28, 1943

2 Memorandum on the History of the Building Program for the College of Education prepared by President's office.

3 Report of Committee on Future Building Program of University of Illinois, p. 20.

"At its most recent meeting our Committee on Future University Programs endorsed the following statement with respect to the projected program in child care and development by the College of Education:

"'We regard a program in child growth and development as an essential one for the University of Illinois. We are not prepared to indicate its relative importance as compared with other programs or to say what physical facilities should be provided.'

"I do not know whether this is sufficiently definite to serve the needs of your Committee on University Buildings, but this seems to be as far as our committee can go at the present time."

The policy of the University is always to emphasize the research function of its colleges and departments. Without laboratory facilities, the program of research of the College of Education, upon which the effectiveness of its teaching and its service to education throughout Illinois and the nation depend, cannot be adequately conducted.

Prepared by College Committee on Buildings:

Charles M. Allen, Chairman
Thomas E. Benner, ex officio
Edwin H. Reeder
Charles W. Sanford
Oscar F. Weber

SUMMARY OF PROJECT

PROPOSED BY

COLLEGE OF EDUCATION

Number		Gross Floor Area	Page
Ed. 1	Laboratory Schools Building	225,000 sq.ft.	6

PROJECT ED. 1

LABORATORY SCHOOLS BUILDING

I. DEPARTMENT LOAD

1. Student Load.--In 1915-16, when the laboratory schools building (of which only an incomplete unit was ever constructed) was planned[1], the teacher certificating laws of Illinois required no college education for elementary school teachers and only two years of college for high school teachers. Now, four years of college work, with at least sixteen hours in education courses, are required of all beginning teachers, except those granted certificates on a temporary basis because of the war emergency. This preparation meets only the requirements for a limited certificate. A life certificate requires the master's degree with at least twenty-two hours of education.

Between 1915-16, when the laboratory schools building was planned, and 1940-41, striking increases have occurred in the instructional and research responsibilities of the College of Education. The extent of these changes is suggested by the following table:

Year	Number of Instructional units taught by the College of Education		Number of Masters' Degrees (M.A.& M.S.)		
	Undergraduate	Graduate	All departments of the University	Education	Per cent conferred in Education
1915-16	2279	612	118	8	6.8%
1940-41	9782	6748	598	280	46.8%
Per cent of Increase	329	1003	407	3400	

1 The building planned in 1915-16 was an H-shaped structure. One wing was to house the classrooms, shops and laboratories of a senior high school (grades 10-12). The other wing was to house the classrooms, shops and laboratories of a junior high school (grades 7-9). The auditorium and the gymnasium for these two units, together with the offices, classrooms and other facilities of the College of Education were to be housed in the connecting unit. Thus, when the building later known as the University High School was constructed, it was not even a complete senior high school unit, much less a complete laboratory unit for the College of Education.

The laboratory secondary school was planned in 1915-16 to provide facilities for observation and for research. Had the building been completed, it would still be inadequate to provide essential opportunities for observation for an undergraduate student body which, as the above table shows, was in 1940-41 more than 300 per cent larger. It would be still more inadequate to provide for a graduate student body which, in 1940-41, was 1,000 per cent larger, as the above table also shows.

In recent years the growth in enrollments in Education, particularly at the graduate level, has been especially rapid. Between 1936 and 1940, the undergraduate enrollment in education at the University of Illinois increased 19 per cent. During the same period the graduate professional enrollment in education increased 350 per cent. Equally striking has been the recent increase in second and third-year graduate professional enrollments in education. The number of second-and third-year graduate professional students in education in 1936 was 11; in 1941 it was 47. Lack of laboratory facilities seriously limits the quality and effectiveness of this greatly increased graduate program.

At present there is an acute, nationwide shortage of teachers. The post-war duty of educating teachers to help reduce this shortage will place new and heavy obligations upon the University of Illinois.

It is not so generally recognized that there is an even more serious shortage of qualified educational leaders. The education of such leaders, particularly at the graduate level, will still further emphasize the inadequacy of the existing research facilities.

The marked increases in enrollments which have already occurred at all graduate levels, together with the increases to be expected as a result of the shortage of qualified leaders in public education, emphasize the urgency of making adequate provisions for laboratory research in education.

2. Research Activity.--It has always been recognized by the staff of the College of Education that one of its major functions is research, but the facilities provided have seriously limited the nature and extent of this research. Research projects involving library materials are reasonably well provided for. Some research involving high school students has been done through the use of the University High School in spite of limitations imposed by distance, by building inadequacies, and by conflicting demands for observation and student teaching. Research projects involving the public schools also have been carried on even though limited by distance and by the reluctance of local communities to open their schools to experimentation directed by persons not under the school boards' immediate control. At best, however, extensive and continuous basic studies of child growth and development are not possible under such conditions at reasonable cost of faculty time and university money.

The departments of the University which would be served by the laboratory school facilities include: Psychology, Home Economics, Sociology, Speech, Biology, Agriculture, Engineering, and Medicine. Several of this group have asked for special facilities in the building.

It should be noted that most of the research which would be made possible by an adequate laboratory would ultimately be expected to benefit by the public schools, the public agency requiring our largest peace-time expenditures.

II. PRESENT SPACE

The classroom, office and laboratory space now provided limits the program of the College of Education in three respects.

1. Distance Limits Use for Research.--The offices and classrooms of

the members of the College staff are so far removed from their only available laboratory that effective use for research cannot be expected.

2. Only One Unit of Laboratory Facilities Has Been Provided.--The present laboratory school involves only the usual four high school years plus a small and selected group used in an experiment in acceleration at approximately the eighth-grade level.

Developments of the past twenty years have consistently emphasized that the education of children is a continuous process, with growth and development at one age largely dependent upon the previous experience of the child. The inescapable implication for research is that it too must be a continuous process beginning with the earliest age levels. A laboratory school enrolling children from two to eighteen years of age would meet this requirement of continuous research.

Another reason for proposing emphasis upon research among children younger than the high school ages is that seventy per cent of the pupils enrolled in the common schools of Illinois are in the kindergarten and elementary schools. Yet the University has provided no adequate laboratory for research below the high school years.

3. The Available Laboratory Unit is Inadequate.--That the present laboratory school buildings are inadequate even for usual high school purposes is demonstrated by this statement by A. W. Clevenger, High School Visitor of the University of Illinois:

> "2. SCHOOL PLANT. (a) Building: In evaluating the adequacy of this school plant, consideration must be given to the fact that this is a teacher-training high school and also that it should be kept in mind that this school is expected to provide some leadership in educational experimentation. On the whole, the building is not very satisfactory and in many respects inadequate for the educational program which this school is expected to provide.

"While some of the classrooms are quite satisfactory, there are certain other rooms and laboratories which are inadequate. This school has a very poor auditorium located in the attic and a gymnasium in a separate building which does not compare favorably with a large proportion of the gymnasiums found in the public high schools. The dressing rooms and shower facilities are inadequate. The biology laboratory is satisfactory only for small classes. It is not a satisfactory laboratory for practice teaching and experimental work. The library room is not large enough to accommodate the pupils and practice teachers who make use of the library. The art room is not very satisfactory and the permanent equipment is not suited to the needs of art instruction in this high school. Some of the classrooms are not provided with enough blackboard space. (b) Location: Fairly satisfactory. (c) Grounds: Below average. Some consideration should be given to the fact, however, that this school has the use of an athletic field owned by the University and also the use of the University tennis courts and swimming pools, but all of these facilities must be used at specified hours in order not to conflict with classes and special activities of University students."[1]

The following excerpt from the 1941 inspection report of Don Cash Seaton, then State Director of Physical Education, criticizes the University High School Gymnasium:

"Facilities -- It is indeed too bad that a school of this design and purpose should be so handicapped in regard to a gymnasium, locker rooms, and showers. As you know, the gymnasium is poorly ventilated, heated and lighted. The locker, shower and toilet rooms are grossly inadequate. The University of Illinois certainly cannot point with pride to this phase of their model high school. We realize, of course, that some of the University of Illinois (proper) facilities are available.

"I suggest that the University give serious consideration to bringing this neglected part of this fine school system up to and beyond what is expected in the high schools of our state."[2]

Lacking an auditorium, the University High School has been using a fourth-floor attic for this purpose. It is now necessary to question such use as a result of unsafe conditions reported by the University Fire Station. In a letter transmitting this report, Director C. S. Havens states:

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1 From the inspection report of Arthur W. Clevenger, High School Visitor of the University of Illinois, dated December 22, 1939.

2 From an inspection report of Don Cash Seaton, State Director of Physical Education, dated February 10, 1941.

"In view of the University's obligation to follow the accepted public building codes, it seems to me that serious consideration should be given to discontinuing the future use of this area. In view of the specific violations of the codes as outlined, I do not see how the University can justify, on a permanent basis, the continued use of the area as has been the practice in the past."[1]

In addition to the limitations of the existing building already pointed out, there is another of considerable importance. The function of the laboratory school is twofold: research and demonstration to college students and teachers from the public schools. If observation is not to interfere with research (and even with usual school procedures), there must be special building facilities which eliminate this interference. In the proposed new laboratory school building, such facilities are provided by observation galleries adjoining many of the class and experimental rooms.

Some of the restrictions upon the proper utilization of the University High School building enumerated above might be removed by modifications of and additions to the existing structure. An auditorium might be built, the illumination improved, the shower and locker rooms enlarged, acoustical treatment added, and room sizes altered. Practicable solutions of these problems would be very expensive, would still leave the facilities subject to serious internal limitations[2], would not alter the handicap of distance, would not provide observation facilities at the high school level, and would provide neither research nor observational facilities below the high school level.

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1 From a letter to Dean Benner, dated January 6, 1944.

2 For a somewhat more detailed analysis of the problems involved, see letter from Principal Charles M. Allen to Director Charles S. Havens, dated January 25, 1944. This letter is included in correspondence transmitted to Professor Huntington with covering letter dated February 1, 1944.

III. POST-WAR DEVELOPMENT

The laboratory school facilities requested in the May 5, 1943 report of the Committee on Building Program of the College of Education, while designed to meet present and long-time future needs, would also provide adequately for the immediate post-war period. Statistics for the United States show that the armed forces and war industries have drawn off approximately 60 per cent of those preparing to teach. Acute shortages have resulted which are paralleled by similar shortages of supervisory and administrative, college and university faculty members.

This means that during the immediate post-war period even facilities which would be completely adequate for a normal situation will be greatly overburdened. It is urgent, therefore, that provision be made as early as possible for adequate facilities at the University of Illinois. Failure to make such provision is likely to produce an irresistible demand upon the teachers colleges for the expansion of the limited graduate programs which three of them have already been authorized to undertake.

IV. PROPOSED NEW SPACE

The College of Education, with the cooperation of other interested departments, has prepared estimates of the floor area which would be needed to provide for the laboratory school building. This totals 225,272 square feet. A detailed analysis of the facilities comprised in this estimate is given below.

The location of the proposed new building, as determined in conference with Director C. S. Havens of the Physical Plant Department, is in the forestry, north of the McKinley Hospital, extending from Lincoln Avenue on the east to the grounds utilized by the program of Physical Education for

Women which surrounds the Women's Gymnasium. The dimensions of this area are approximately 725 feet by 625 feet.

The building estimate does not include some university services which, it is possible, should be transferred to this location. For example, it might be decided that the state-wide high school testing program should be located in the laboratory schools building. This would help to bring together the university services which deal with the educational problems of the public schools. It would, furthermore, make the data gathered by this office more easily accessible for educational research and teaching.

It has been suggested that the laboratory schools building should include a junior college. This would facilitate research, teaching and demonstration in the problems of the junior college development in Illinois including the problems of technical and area vocational schools. Because it was felt that public opinion was not yet ready for such a development it has not been included in this proposal.

The proposal outlined below has been prepared with special attention to ease of adaptation to the needs of additional research groups which may wish to make use of the laboratory. The provision for such research could be made within the limits of the specifications which are presented.

1. Nursery School

Administrative Suite . . . . . 1,320 sq. ft.

Principal's office	Medical examination room
Clerk, files, etc.	Isolation room and storage
Waiting room	

Instructional facilities . . . . . 12,080 sq. ft.

4 Nursery school rooms, observation galleries and toilets	4 experimental rooms
	College classroom
	3 College offices
Kitchen and food storage	2 Adult toilets

Add 25% of above space for corridors, etc. . . . . 3,350 sq. ft.

Total for Nursery School 16,750 sq. ft.

2. Elementary School and Kindergarten

Administrative suite . . . . . 900 sq. ft.

Principal's office
Clerk, files, etc., waiting room
Storage and supplies

Instructional facilities . . . . . 36,290 sq. ft.

2 Kindergarten rooms with observation galleries and toilets
1 Auxiliary elementary room
12 Elementary rooms with observation galleries
Library room
6 Experimental, testing and individual instruction rooms
Gymnasium (two-story, 3500 sq. ft.)
Gymnasium office, showers, toilets, lockers
College classroom (large)
College classroom (small)
Elementary school toilets
2 Adult toilets

Add 25% of above space for corridors, etc. . . 9,300 sq. ft.

Total for Elementary-Kindergarten 46,490 sq. ft.

3. Facilities Common to Elementary and High School and College

Administrative suite - Director of Laboratory Schools . . . . . 900 sq. ft.

Director's office
Clerk, files, etc.
Committee room

Clinics . . . . . 2,980 sq. ft.

Waiting room and general office
Play room
Speech clinic: diagnostic, recording, laboratory rooms, cubicles
Educational clinic: equipment, test materials, books
Psychological clinic and counseling center:
2 research offices
5 individual testing and counseling rooms

Other Facilities . . . . . 35,050 sq. ft.

Auditorium to seat 750, including stage, dressing rooms, etc. (two-story, 8,000 sq. ft.
Library for high school junior high school, and college, including reading rooms and stacks
Faculty-college student room with toilets, rest room and kitchenette
Cafeteria to seat 150, including kitchen, food storage, and service
Vocal music, dramatics and photographic room
Photographic dark room
Orchestral music room
Visual aids projection room

Add 25% of above space for corridors, etc. . . 9,734 sq. ft.

Total, common facilities 48,664 sq. ft.

4. Secondary School

Administrative suite . . . . . 1,175 sq. ft.

Principal's office
Asst. Principal's office
Stenographer, files, waiting room
Public address system, and committee room

Instructional facilities . . . . . 65,735 sq. ft.

8 Smaller classrooms
7 Larger classrooms with observation galleries
7 Laboratories and shops with observation galleries
5 Storage rooms
12 offices
3 small testing, experimental and individual instruction rooms
3 larger testing, experimental and individual instruction rooms
Gymnasium (two-story, 10,000 sq. ft.)
Swimming pool, lockers, showers, and physical education offices
Toilets and lavatories

Add 25% of above space for corridors, etc. . . 16,727 sq. ft.

Total Secondary School 83,637 sq. ft.

5. College of Education

Administrative suite . . . . . 2,120 sq. ft.

Dean's office
Asst. Dean's office
Stenographers, clerks, files and waiting room
Committee room
Work room, storage

Coordinator, University Council on Teacher Education 1,625 sq. ft.

Coordinator's office
Stenographer, files, waiting room
Committee room

Bureau of Educational Research . . . . . 1,750 sq. ft.

Director's office
2 Assistants' offices
Stenographer, files, waiting room
Statistical Laboratory
Work room

Placement Bureau . . . . . 1,835 sq. ft.

Secretary's office	Work room, storage
Assistant's office	Two interview rooms
Stenographer, files, waiting room	

High School Visitor . . . . . 2,075 sq. ft.

Visitor's office	Stenographer, files, waiting room
3 Asst. Visitors' offices	
Committee room	

Other Facilities . . . . . 14,320 sq. ft.

Exhibit room	2 Seminar rooms
20 Faculty offices	2 Large classrooms (capacity 50)
Large lecture room (capacity 200)	2 Small classrooms (capacity 30)
Conference room to be placed near auditorium	Toilets

Add 25% of the above space for corridors, etc. . 5,946 sq. ft.

Total College of Education 29,731 sq. ft.

Grand Total: Laboratory Schools Building . . . . . 225,272 sq. ft. gross area

Certain parts of the building, such as the observation galleries and several of the schoolrooms, should be air-conditioned. These facilities will be heavily used during the summer and because of their nature should have this special treatment. In addition, it would be desirable to air-condition the library, college classrooms and seminar rooms for summer session use.

V. FUTURE DEVELOPMENT

The entire laboratory schools project is designed to meet present needs. This seems the best means for providing for the long-time future development of the program of research, teaching and service of the College of Education and other University agencies interested in the growth and development of children and youth.

VI. SUMMARY

In its introduction this report suggests that University policy already includes the provision of adequate laboratory facilities for the College of Education. The proposal of the College that these facilities be made available to all departments of the University interested in the growth and development of children and youth is also in accord with general University policy.

The discussion of present space has pointed out that the University High School is not even a complete high school unit, cannot provide adequately for observation, and is too remote from the offices and classrooms of the faculty to make possible its effective use for research. Furthermore, since growth and development at one age level cannot be adequately studied in isolation from studies of growth and development at lower age levels, the University High School even though complete in all respects, would be inadequate as a laboratory facility for research in education and related fields. The incomplete high school unit, known as the University High School, was planned in 1915-16. Since that time, the undergraduate instructional load in education has increased 329 per cent; the graduate instructional load has increased 1003 per cent, and the number of masters' degrees granted in education has increased 3400 per cent.

Adequate laboratory school facilities for the study of growth and development of children and youth by the College of Education and other interested departments of the University would require nursery school, elementary school and kindergarten, high school, college and other facilities which would utilize an estimated total of 225, 272 square feet of floor space.

Prepared by College Committee on Buildings.

SECTION 8

PROJECTS PROPOSED BY

SCHOOL OF PHYSICAL EDUCATION

SECTION 8

PROJECTS PROPOSED BY

SCHOOL OF PHYSICAL EDUCATION

GENERAL COMMENTS

Recent draft board medical reports have again made it clear that a very large percentage of the American people possess handicapping physical defects and deficiencies. Twenty-five percent of our 18-year old youth are being rejected for military service.

National Safety Council reports indicate a terrific human wastage through accidents. Over 100,000 individuals are killed annually; and 10,000,000 are injured.

Industrial health reports indicate a tremendous amount of illness. Statistics show that 3,000,000 people are ill enough to be incapacitated for work every day in the year.

Army and Navy motor fitness studies have revealed that an appalling percentage of our youth are physically incompetent and soft. Fifteen percent of college age young men cannot swim; and 25 percent do not have sufficient strength in their arms to chin a bar five times.

The United States has a higher rate of crime and juvenile delinquency than any country.

It is generally agreed that much of the human wastage noted above could be reduced or eliminated, and further that educational institutions should take the leadership in attacking the many problems.

The School of Physical Education is engaged in (a) training physical education teachers, health teachers, safety teachers, athletic coaches, camp

leaders, and recreation leaders, (b) conducting a service program in physical education for undergraduate students, and (c) conducting recreation programs for undergraduate students, and is therefore directly or indirectly concerned with all of these problems.

It is to be noted that the work of the School is centered in activity --gymnastics, athletic games, recreational sports, aquatic activities, and dance. Furthermore, special facilities are required to carry on these activities--gymnasia, exercise rooms, swimming pools, locker rooms, shower rooms, courts and fields.

The facts presented above suggest that at the close of the war it might be advisable to expand the School's programs in several areas. Current indications suggest that the University's enrollment might be materially increased after the war.

The School's building needs thus should be given a high order of priority in considering the University's post-war plans for development. Fifteen thousand students require a lot of facilities.

Prepared by: Seward C. Staley
Director of School of Physical Education

SUMMARY OF PROJECTS

PROPOSED BY

SCHOOL OF PHYSICAL EDUCATION

PROJECT P.E. 1

ADDITION TO HUFF GYMNASIUM

I. DEPARTMENT LOAD

1. Pre-war Professional Training Program.--Male students enrolled in School of Physical Education in fall of 1941--293. These students were required to secure 40 hours credit in professional courses including activity courses such as football or swimming, and theory courses such as Training and First Aid, and School Program in Health. The Department offered 26 sections for these students. Classes in each section met from 2 to 10 hours per week. Total enrollment 778; average class enrollment 30.

2. Pre-war Service Program.--All freshmen and sophomores were required to take physical education. Students with defects were required to attend 3 hours per week. Students without defects were required to attend 2 hours per week. The Department offered a wide variety of activity courses such as wrestling, apparatus stunts, six man football, handball, and beginning swimming. In the fall of 1941, 4,248 students were enrolled. The total undergraduate male enrollment was 7,301. 133 sections were offered. Average enrollment per section was 31.

3. Pre-war Varsity Sports Program and Intramural Sports Program.--This program carried on by the Department of Intercollegiate Athletics, is closely related to the program carried on by the Department of Physical Education for Men. In 1941, the program included varsity teams and freshman teams in 11 different sports with approximately 1,000 men, and intramural leagues and tournaments in 20 different sports plus a variety of special events with approximately 4,000 men, each participating from 1 to 10 times.

II. SPACE AVAILABLE

1. General Comments.--The programs outlined in paragraph 1 were carried on principally in the Huff Gymnasium, in the Men's Old Gymnasium, and on the fields adjacent to these buildings. The Stadium and adjoining areas were also used to a limited extent.

2. The Huff Gymnasium.--This is a semi-fireproof building constructed in 1925-26, has 125,940 square feet of floor space. It is to be noted, however, that most of this space is taken up by corridors, stairways, balconies, offices, locker rooms, shower rooms, supply rooms, and ordinary class rooms. Only one-third of the total floor area is available for activity purposes. The areas available for activities are as follows:

Room 100	- 23,058	sq. ft.
Room 307	- 6,238	" "
Room 75	- 1,170	" "
Pool	- 4,500	" "
Handball courts	- 9,600	" "
	44,566	" "

This building thus can conveniently accommodate 5 activity classes at one time with one class per room. By placing two classes in Room 100, six classes may be accommodated. This latter arrangement is quite unsatisfactory, but was used consistently during 1941 and in earlier years.

3. Men's Old Gymnasium.--This plant includes three buildings as follows: Men's Old Gymnasium was constructed in 1902-03 with ordinary masonry and wood construction and provides 34,440 square feet of floor space. Old Gymnasium Annex, was constructed in 1889-90 with ordinary masonry and wood construction and provides 20,388 square feet of floor space. Engine Annex, was constructed in 1917-18, as an engine laboratory, with ordinary masonry and wood construction and provides 7,172 square feet of floor space.

The total floor space in Men's Old Gymnasium plant is 62,000 square feet. It is to be noted, however, that a considerable proportion of this area is used for training quarters, shower rooms, offices, locker rooms, corridors, etc. Of the total floor space only two-thirds is available for activity purposes.

Old Gymnasium floor -	14,613	sq.	ft.
Gymnasium Annex floor	14,523	"	"
Engine Annex floor -	7,172	"	"
Swimming pool -	4,500	"	"
	40,808	"	"

The Men's Old Gymnasium plant thus can conveniently accommodate 4 classes at one time. By installing two classes in each floor area, excluding the pool, seven classes can be accommodated.

In 1941, all of the above areas were used to capacity from 9:00 a.m. until noon and 2:00 p.m. to 6:00 p.m. on Monday, Tuesday, Wednesday, and Thursday. During most of these hours two classes were assigned to each area. The areas were used somewhat less from 8:00 a.m. to 9:00 a.m. and 1:00 p.m. to 2:00 p.m. daily, to avoid strenuous exercise after eating, and on Friday and Saturday. Service classes were scheduled on Monday through Thursday. It may be noted that during this period 350 students were enrolled in classes meeting in the Union Building and the Woman's Building. These classes were in bowling and dancing and probably will not be revived at the end of the war.

The office space available in the Huff Gymnasium and the Men's Old Gymnasium is totally inadequate. In two instances eight or ten instructors were crowded into one small office and three or four men were assigned to the same desk, each being assigned one drawer. The Intramural Sports Office was housed in a room approximately 12 by 20. Not infrequently 20 or more individuals such as instructors, secretaries, managers, officials were crowded

into this area trying to work.

The Men's Old Gymnasium plant contains one ordinary class room; Huff Gymnasium contains 3 ordinary class rooms, one projection room, and one graduate seminar room. The latter has now been converted into an office housing the football coach and staff. The class room space at times was totally inadequate.

III. POST WAR DEVELOPMENT

It is anticipated that the following developments may occur after the war.

1. Some increase in enrollment of male professional students in physical education
2. Some increase in the total University undergraduate male enrollment.
3. Some expansion in the University physical education requirement over that which was in effect before the war. Before the war the requirement was 2 years for 2 or 3 hours per week. The war requirement is 4 years for 3 hours per week. The post war requirement might include: (a) an increase in the number of years, (b) an increase in the number of hours per week, or (c) both, over that in effect before the war.
4. Some expansion in the University's varsity and intramural sports programs over that in effect prior to American participation in the war.

The point to be noted in connection with the above developments is that each would require additional space. The present plant could absorb a slight expansion over the pre-war load but certainly could not effectively absorb an overall expansion of more than 15 or 20 percent.

In addition to the above, the following developments are anticipated and desired:

1. A material increase in the number of graduate students and graduate classes. Before the war the department offered only a minor in physical education toward the master's degree. During the past year the department has been authorized to offer a master's degree in physical education. Also candidates for the Doctor of Education degree may elect Physical Education as a field of specialization. The department plans to request permission to offer work leading the degree of Doctor of Philosophy in physical education.

2. Establishment of a research program in physical fitness and associated matters. The following statements taken from a recent report regarding this matter outline the essential features of the proposed enterprise.

"The recent draft statistics and other studies have revealed fundamental deficiencies in physical fitness. The proportions of motor unfitness among men are appalling. Large numbers of young men are entering adult life unconditioned and unmotivated to maintain physical fitness. This trend undoubtedly contributes greatly to the high accident rates, rapid loss of health after the age of thirty and widespread chronic disease because of the failure of education to provide effective methods of preventive hygiene and conditioning work. Some 50 percent of young men have been rejected from the armed services; some 95 percent have failed to meet the aviation standards; and only four out of twenty men of age forty passed the army health standards. Moreover, a large proportion of those accepted for service were found to be very deficient in swimming ability, energy

capacity and athletic ability according to reasonable standards.

"Expanding programs of physical fitness have created many new problems in the area of health, physical education, and recreation. Many of these problems need to be studied and analyzed under the controls and with the methods used in a laboratory equipped to study exercises and their relationship to organic efficiency, physique, and health in general.

"A great variety of dynamic programs have recently come into existence, large based upon the supposition that the exercise programs will make a profound contribution to present wartime efficiency and long time health of the participants. The nature of the effects of the program should be studied, the amounts of improvement should be measured, and the wise limitation of the exercises should be established. It hardly seems reasonable that such studies should be made by groups having only a secondary interest to the dynamic work but should be made by the keenest research workers of the physical education field. Now is the time to develop the facilities for this work because the spearhead of advance for the physical education of the future will be in this physical fitness area. The need for immediate action is apparent if the School of Physical Education is to take advantage of the situation.

"Preliminary studies at the University of Illinois School of Physical Education indicate that research in the dynamic phases of physical fitness has tremendous importance. Some worth-while results have been obtained already but more extended research with better laboratory controls is needed to further this work. Hence, the proposal for a Physical Fitness Laboratory is made as one of the most strategic moves to advance the professional work in physical education.

"Especial note should be made of the fact that the wartime programs in physical fitness as promoted by the Physical Fitness Division of the Federal

Security Agency, by the United States Office of Education, by the Army and Navy, by the Y.M.C.A.'s and Y.W.C.A.'s, by the American Amateur Athletic Union, by the National Collegiate Athletic Association, by the American Association for Health, Physical Education and Recreation, and also by the American Legion have all centered on the programs of physical training. This emphasis is legitimate from the developmental and preventive points of view. Medicine and Public Health have centered mainly on the disease control and curative approaches and have not adequately dealt with the research in exercises and sports. Considerable acceleration of research in physical fitness work has developed in physical education research centers in the past few years.

"Many types of laboratories have dealt with the analysis of exercise, such as, those in biology, chemistry, physics, anatomy, zoology, physiology and home economics. Except in a few instances of laboratories equipped to study the human body in action, the work in the main has been quite indirect through animal studies and made by people who are not highly specialized in physical exercise for human beings. In the professional work of physical education there is great need for such work to be scientifically developed in the closest possible relationship to the practical and theoretical work of this same field. Moreover, there is need for a centralized effort on certain strategic problems already indentified in physical education as a result of the very great increase in the dynamic aspects of the physical fitness work.

"With the development of a central laboratory in the School of Physical Education there should logically be advisory and cooperative relations with the other human science fields, such as, medicine, physiology, psychology, anthropology, physiotherapy and nutrition. Some connection to competi-

tive athletics is desirable in order to secure types of cooperation needed for the study of upper levels of ability. The principal focus for several years will be in studies which will affect the basic curricula of physical training for the masses of students and workers in the public schools, colleges, industries, and adult recreational centers. An important prediction is an enlarged development of dynamic physical fitness programs for industrial workers. Certainly a great number of rehabilitation exercise problems will need study immediately after the war. The relation of exercise to health, safety, morale--working efficiency in general, needs to be included in such studies made specifically from the physical education point of view. This would permit physical education to grow in its own right as a professional field.

"Some types of studies in the proposed laboratory would include research on the specific nature of fitness from the dynamic point of view. In general, these studies will center on the relative value of exercise contrasted with diet or passive therapeutic procedures; the relation of activities of balance, flexibility, agility, strength, power, and endurance to organic condition; the gradation of exercises according to relative difficulty in each of the areas of balance, flexibility, agility, strength, power and endurance; the organic involvement of various types of fitness exercises; the effect of various types of fitness exercises on developing and normalizing the physique; the analysis of tests of motor fitness and the construction of relatively more efficient tests; and the development of standards of fitness for civilian occupations and activities, particularly flying aircraft. Many of these studies cannot be made without adequate laboratory facilities.....

"The University of Illinois has some unique advantages which strengthen the case for the development of a Physical Fitness Research Laboratory.

Some of these are listed as follows:

1. A considerable start in physical fitness work has already been made at the University of Illinois, which has produced favorable comment from many prominent individuals representing the leading organizations and agencies interested in such work. The project has already gained momentum with relatively little financial assistance or laboratory facilities.

2. Many problems have been referred to the research specialists in the School of Physical Education by such individuals and organizations expecting that there may be some helpful solution forthcoming from the University of Illinois.

3. The large student body, superb library facilities, excellent physical accommodations, close existence of allied scientific departments, and a nearby developing air field are important resources. Presence of large Army and Navy units here adds greatly to the possibility of making significant studies in which the government and civilian aeronautics officials have an interest.

4. Reasonably close relation to the medical diagnostic and analytical facilities at the University Medical School, University Health Center, the University Hospital and the Carle and Christie Clinics.

5. Central relationship of such work to the professional curricula in the School of Physical Education. Location of this research center on the Urbana campus would make possible valuable demonstrations to these centers.

"Outcomes to be expected:

1. New knowledge and techniques of physical fitness work which will undoubtedly help in the formulation of new textbooks, tests and methods of administration.

2. Permit the University of Illinois to make a worthy contribution to the rapidly developing scientific work of physical fitness.

3. Make the research done in the gymnasia, pools and on the fields more significant because of controlled experiments to go along with the practical field studies.

4. Place the University of Illinois in a favorable position to make continuous contributions to physical fitness problems of importance with the Army and Navy, United States Public Health Department, Federal Security Agency, State Departments of Education, foundations, and many youth and adult agencies interested in this work.

5. Some financial support from the organizations above may be reasonably expected because of a good deal of money that has recently been made available to aid the development of physical fitness work.

6. Extending the scope and significance of the physical fitness research already accomplished in the past two years in the research department of the School of Physical Education (see appended exhibit and list of studies). Strength would also be given to the existing graduate course in Physical Fitness already offered in the School of Physical Education."

The proposed laboratory should be adjacent to a gymnasium. It should include photographic facilities, special exercising devices, cabinets, tables, and other ordinary laboratory accommodations. It is estimated that 3,000 feet of floor space will serve the need. This will include laboratory offices, photographic rooms, etc.

IV. PROPOSED NEW SPACE

The construction of the north wing of the Huff Gymnasium should meet most of the more pressing building needs of the Department of Physical Education

for Men, at least for the decade following the war. The wing could be designed to provide four floors including a basement and three floors above ground. The space could be arranged to provide:

2 gymnasiums 150 x 55 each

1 small gymnasium 50 x 70

1 research laboratory 50 x 60

4 offices

1 class room

1 graduate seminar room

locker and shower accommodations

4 or 5 standard handball courts

Prepared by: Seward C. Staley
Director of School of Physical Education

PROJECT P.E. 2

RECONSTRUCTION OF THE HUFF GYMNASIUM POOL AND THE OLD GYMNASIUM POOL

Both of these pools fail to meet the standards for safety and sanitation set up by the State Department of Public Health. The following inspection report prepared by the Department of Public Health presents the essential needs. The items listed for immediate correction should be corrected without delay. The other items should be reviewed; any of these which appear to be practicable likewise should be corrected.

"In accordance with your request for an inspection and conference regarding the University of Illinois swimming pools, Engineer Walker has reported on his inspection and conference made December 14 and 15, 1939. As a result of this conference and at the request of President A. C. Willard, we submit herewith a condensed report and recommendations on the conditions needing improvement at the University pools."

"This report lists those items at each of the three pools which do not conform with the Minimum Sanitary Requirements for swimming pools and bathing places adopted by this department. The report also includes comments and recommendations on items which we feel should be corrected in the interest of physical well being and safety. In preparing this report primary consideration was also given to the practicability of making these changes and particularly from the financial standpoint. We do not desire to minimize any of the sanitary requirements, but it is obvious that some of these requirements have much greater health significance than others. The public health danger of some of the defects is partially off-set by the present excellent operation of these swimming facilities. Thus in presenting the need for these improve-

ments, we do not wish to convey the idea that health hazards exist which would necessarily warrant the closing of these pools, but because the University is an educational institution, we feel that these facilities should at least exemplify all of the minimum requirements of a modern and properly constructed and operated swimming pool.

"Three separate divisions are made in listing the recommended changes and improvements:

1. Those improvements which should be given immediate attention.
2. Those which should be made within at least the next two years.
3. Those which should be corrected as soon as practicable.

DIVISION I

Huff Gymnasium

1. Spectator Area.---Provide protection along the first tier of seats in the north section which will prevent the spectators from kicking dirt into the pool area.

2. Overflow.---Provide additional drains in the overflow at the east and west ends of the pool.

3. Closed System Operation.---Increase the size of the pipes which carry the overflow water in order to facilitate proper closed system operation. Also the walk drainage should discharge the waste through a separate system of pipes.

4. Filter Area.---Provide additional filter area to give the pool a six hour turnover.

5. Cross-Connections.---Break the present connection between the main drain and the sewer and provide an open surge tank to break the connection between the drinking water supply and the swimming pool water.

6. Bathing Suits.--Provide suits, for mixed recreational swimming, of such quality which will permit laundering after each use.

Old Gymnasium

1. Toilet Facilities.--(a) Provide a toilet in the dressing room used by the women during mixed recreational swimming, (b) Change the location of the present urinals in the pool room to conform with accepted standards.

2. Cross-connections.--See Division I item 5 Huff Gymnasium

3. Filter Area.--See Division I item 4 Huff Gymnasium

4. Bathing Suits.--See Division I item 6 Huff Gymnasium

5. Ceiling Height.--Because of the safety hazard involved if the diving board is replaced, 13 feet of headroom above the board must be provided.

DIVISION II

Huff Gymnasium

1. Dressing Room.--There is a dire need for a dressing room adjoining the pool, which would accommodate varsity and freshmen swimmers as well as women swimmers during recreational swims. It is suggested that a room be used for this purpose which is now occupied by the unfinished shallow pool beneath the west bleachers. Such a room must be equipped with shower, toilet facilities and lockers.

2. Chlorination Equipment.--Locate the chlorinator in a gas tight rust-resisting enclosure, vented to the outdoors with positive ventilation.

3. Towels.--Change the towel rooms to provide separate counters, one for dispensing clean towels and one for receiving soiled towels.

Old Gymnasium

1. Chlorination Equipment.--See Division II item 2 Huff Gymnasium

2. Towels.--See Division II item 3 Huff Gymnasium

3. Pool Shower Room.--Remove the west bleacher section to facilitate the construction of an additional pool shower room to replace the present inadequate facilities. This will also allow for better control during the mixed recreational swims.

DIVISION III

Huff Gymnasium

1. Pool Depth.--Under the present conditions the pool is not adapted for 3 meter springboard diving because of the inadequate depth of 8 feet. The board and standard have been removed from the pool room, however, if in the future it is the desire of the University to provide 3 meter diving facilities the pool should be deepened to give a minimum depth of 11 feet, and preferably 12 feet.

2. Acoustics.--Finish off the ceiling with acoustic material. It is now difficult for the instructor to conduct classes because of noise interference. Also the concrete covering over the ceiling blocks continues to drop off into the pool.

3. Ramp--Eliminate the stairs leading from the shower room to the pool and provide instead a ramp with non-slip material.

Prepared by: Seward C. Staley
Director of School of Physical Education

PROJECT P.F. 3

COMPLETION OF INTERIOR OF HUFF GYMNASIUM

The central unit and the south wing of the Huff Gymnasium were erected in 1925-26. A large portion of the interior was left unfinished at the time the building was erected. The building, as a result, is not being used with maximum efficiency; some services are handicapped; and some parts of the building are most unattractive. The building should be completed at the earliest possible date. The items most in need of attention are as follows:

1. Construct a locker room and a shower room in the area under the Swimming Pool bleachers (the overhead space in Room 75). This room would accommodate 80 or 90 lockers and would be used as a dressing room by the varsity swimming team. This room could also be used as a women's dressing room in connection with the program in mixed swimming. The dressing arrangements provided for women at present are very unsatisfactory. At the present time this area serves no purpose and is waste space. The Physical Plant Department has prepared plans covering the construction of this room.

2. Construct an adequate supply room. The present room is most unsatisfactory.

3. Construct a dead storage room. At the present time two handball courts are being used for dead storage spaces. The two handball courts are needed for playing purposes.

4. Construct a corridor along the west side of the east shower room; also a corridor along the east side of the west shower room. At the present time the main lines of traffic in the basement run through these shower rooms. This is most inconvenient when the showers are in use. The duckboard walks through the shower room are a hazard.

5. Install 2 or 3 drinking fountains in the basement. At the present time there are no drinking accommodations in the entire basement area. Not infrequently 2,000 or more individuals use this area daily.

6. Install adequate toilet facilities in the basement. The facilities available at present are quite inadequate.

7. Reconstruct the Faculty Locker Room. The facilities provided in this room are of a temporary nature. Quite frankly, the room is a disgrace to the University.

8. Plaster the walls in the entire basement area. The unfinished walls and the clutter of pipes and devices installed in this area make it most unattractive.

9. Plaster the walls in Rooms 301 and 305. These walls were left unfinished when the building was constructed. Both rooms are most unattractive.

10. Install an adequate ventilating system. This is particularly needed in the basement where at times the odors are overpowering. Not infrequently these odors permeate the entire building.

Prepared by: Seward C. Staley
Director of School of Physical Education

PROJECT P.F. 4

ADDITIONS TO WOMEN'S GYMNASIUM

I. INTRODUCTION

The post-war plans presented in the following report are based on the pre-war program. The departmental program is being carried on in the Woman's Building for the duration of the war under limiting conditions; and consequently does not represent the normal work of the department in aim, objectives or content.

II. DEPARTMENT LOAD

Average teaching hours per week per instructor	18
Conferences (individual health and class advisory)	2
	20
Number of instructors	10
Students registered in physical education, 1942-43	1628
Number of students per instructor	162
Students registered in physical education, 1943-44	1863
Number of students per instructor	186

The statistics on enrollment of freshmen women for the past three years show an increase of 297 women entering the University as freshmen. The freshman enrollment in 1941-42 was 883 and in 1943-44 was 1,180. This represents an increase of 33.6 per cent during the war period. The freshman enrollment for 1916-17 was 531 and the year after World War I which was 1919-1920, it was 834, an increase of 57 per cent. These statistics would indicate a consistent and considerable increase for the duration of the war and a much greater increase during the first and second years after the war.

The need for three full time instructors is believed to be a proper estimate because of anticipated increase in enrollment and because of the desirability of reducing the size of classes. In several activities the en-

rollment should be reduced 50 per cent in order to secure the best results.

III. PRESENT SPACE

The space normally used by this department is as follows:

Net area in Women's Gymnasium. . . . . 62,000 sq. ft.

Net area in Woman's Building . . . . . 8,200 sq. ft.

This space is divided as follows:

Women's Gymnasium

Second floor.--Has 1 gymnasium with apparatus and 1 large gymnasium with no equipment.

Mezzanine floor.--Has space for fencing, table tennis, and shuffle board. Also space for Lounge, kitchenette, small rest room, small corrective gymnasium, and one office.

First floor.--Has six offices, study room, two class rooms and two shower-locker-dressing room units.

Basement.--Has Archery range.

Third or Attic floor.--Has sloping roof; girders divide this space into rectangular courts.

Woman's Building

The Woman's Building has one large gymnasium, which has been used for basketball (since this gymnasium space was not otherwise utilized after the department moved into the new gymnasium, and because it was not possible to use basketball goals in the new building, this activity has been continued in the Woman's Building.) Use of skating rink (8 hours per week) and bowling alleys in the Illini Union Building (10 hours per week) and use of riding stables, (privately owned).

IV. POST WAR DEVELOPMENT

Plans for post-war program include the following:

1. An expanded program for students in service courses

Health education

a. Motor tests for fitness for all women students

Broader range of activities

2. A four year curriculum in Recreation and Recreation Leadership designed to meet the post-war need of youth and adult.

3. A five year major curriculum, and a four-and five-year minor curriculum in physical education.

4. A four-year curriculum in the Dance.

5. An all university recreational program for faculty and students.

6. Much smaller classes to insure individual attention.

Courses and curricula proposed will aid students who are preparing to teach to meet the state certification laws for teachers of physical education.

The development of the program according to these plans would require two additional full time teachers, besides those proposed on page one.

V. PROPOSED NEW SPACE

1. Addition of wings to Women's Gymnasium. The north wing to include games room, corrective gymnasium, offices; games room now temporarily located on mezzanine floor which in the original plan is designed for a locker-shower-dressing room unit. The south wing is planned as a swimming pool unit. This would release the pool in the Woman's Building for recreational use.

2. Riding stables, owned and operated by the University.

VI. FUTURE DEVELOPMENT

1. Provision for counselling service, requiring a specially trained, full-time person.

2. Plan whereby supervisor of teacher training will visit high schools in the state in which graduates hold positions. This opportunity for appraisal of teaching will also aid in strengthening the teacher training course in physical education. Each of these projects would require a full time person.

VII. SUMMARY

1. Addition of Space.--(a) Wings added to present unit of Women's Gymnasium - 21,900 sq. ft., and (b) Riding stables owned and operated by the University.

2. Addition of Staff.--(a) Three full time instructors, with anticipated increase in enrollment, (b) Two full time instructors, with program expansion as proposed, and (c) Two full time instructors in plan for future development.

3. Expansion of Program in Five Areas.--(a) Health and physical fitness, (b) Curriculum for students majoring in physical education, (c) Activity program, (d) Recreational program, and (e) Research.

These requests for additional staff, space, and facilities are justified by the worth of the proposed program, and the service to be rendered.

It has been conclusively demonstrated since the beginning of the war that our youth were not physically fit. Results of our Army draft boards and of Motor fitness tests given in schools and colleges indicate that both men and women have a low rating in physical strength and endurance. Any health

and physical education program will have as a post-war aim the education for physical fitness, which will necessitate a constantly expanding program with adequate facilities. Although this would seem to give chief emphasis to the physical welfare of the individual, the social and emotional value are equally important. It is essential that the University utilize every available means to give to its students the best health and recreational service possible, as an important part of their education for the most effective citizenship.

Prepared by: Professor Louise Freer
Head of Department of Physical Education for Women

PROJECT P.E. 5

CAMPUS PLAYING FIELDS

The Board of Directors of the Athletic Association studied the need for adequate playing fields on the campus and made a report to the Board of Trustees in the fall of 1940. The Athletic Association report is quoted in the following paragraphs.

Last summer the Board of Directors of the Athletic Association gave expression to its feeling that the development of its athletic facilities should follow a well-considered, unified, long-time plan by the appointment of a Committee on Future Development of Physical Education and Athletic Facilities. Undoubtedly, in the past, continuity of effort has been accomplished through the vision of the Director of Athletics, members of the Board, and the Business Manager, but particularly with a more rapid turnover in our Board, a long-range program becomes increasingly necessary. There is always a tendency to use any surplus of income for the project of the moment, rather than to accumulate a building fund that can be earmarked for carefully defined objectives for future accomplishment.

Another reason, and an extremely compelling one, is the increasing scarcity of sites for University buildings and the consequent loss to the athletic department of the use of campus areas that have for a long time been at our disposal for intramural and recreational activities. It is the object of this committee to plan for present and future uses of land, buildings and other facilities in such a way that our needs will be recognized in the general development of the campus, and so that we will not wake up on some future date to a realization that our facilities for intercollegiate, intramural, and recreational sports are totally inadequate. In such a situation, the irre-

placeable item is that of playing fields within reach of the student body.

Another object at the present time is to present an outline of our needs for additional buildings. For a number of years the Athletic Association has just been able to balance expenditures by income. Our reserves are so small that an unusual demand, such as major repairs to Stadium, Ice Rink, a new heat tunnel, or similar items, might wipe them out in a single year. Depreciation on a two-million dollar structure like the Stadium should alone call for a reserve of at least $20,000 to $30,000 per year, which we have not been able to provide. It seems very evident, therefore, that to secure any large building for athletic uses, we must depend upon a state appropriation. Such a building should properly be treated just as any other project on the University's building program.

A trend to which we have given much thought is the increasing interest of the student body in intramural sports. Of about 9,000 men students, it is estimated that 3,000 to 3,500 are competing on one or more organized intramural teams, besides the large number that play golf, tennis, softball, etc., as unorganized recreational sports. All of these students make use of the athletic facilities provided. As an indication of the direction in which we may be expected to develop, compare the intramural budgets for the leading Big Ten universities, exclusive of salaries. The budgets at the leading schools are: Minnesota $32,000; Ohio $25,000; and Michigan $20,000. Illinois occupies fifth place with a budget, including salaries, of $7,170.

As a result of our studies to date, we wish to present to the Board of Trustees the following outline of objectives, all of which we feel are justified by present needs, without reference to future requirements, except that we feel confident that even with a possible decrease in student enrollment

there will be greater and greater activity in the field of intramural and recreational sports. In the following list, most of the items relate to present and proposed allocation of land for athletic purposes. It is hoped that by a statement of the uses planned for the various areas, allocations for such areas as sites for University buildings may be avoided. The order of presentation of the various items in the list is not significant of their relative importance. The numbers assigned to the various items correspond to the numbers on the accompanying map. The following line of action is proposed:

1. The present Illinois Field is to be retained indefinitely for use by freshman and varsity baseball teams. The wooden bleachers, removed this year, will be replaced by temporary steel bleachers now on hand for occasional use at the south end of the Stadium, and which are adequate for baseball crowds. The Old Gymnasium and Gymnasium Annex will be used for wrestling, gymnastics, fencing and intramural athletics. Illinois Field at present serves students at the University High School as an athletic field.

2. The remainder of the drill field should be retained for class use and competition in golf and intramurals. It is understood that the new Men's Dormitory may be followed in the future by similar units to the south along Fourth Street. It is assumed that no further buildings will be erected on the remainder of the field.

3. The entire block of land surrounding Huff Gymnasium, from Gregory Avenue to South Drive and from Fourth Street to Sixth Street should be retained for athletic use.

4. In the event that a new golf course is constructed, the area occupied by the present golf course would be desirable for intramural uses, and for a polo field.

5. The area south of the New Power Plant, between Stadium Drive and Gregory Drive, First Street and the I.C.R.R. tracks has been considered for many years as a site for a new Illinois Field, containing varsity and freshman baseball diamonds, and grandstands. While this area is now somewhat crowded, as a result of the location of the Power Plant, it is requested that this land be definitely allocated for such future use.

6. About 160 acres of land, between First Street and the I.C.R.R. tracks, south of Stadium Drive, has been long considered as the site for a new 18-hole golf course. Our present 9-hole course is inadequate and dangerous. It is of no use to our varsity golfers, who play elsewhere. In contrast, the University of Michigan has a beautiful 18-hole course; the Ohio State University has just completed a 36-hole course, including a very pretentious club house. A tentative layout of an 18-hole course for this tract of land has been made. This layout should probably be modified to provide practice driving and approaching fairways, which would be especially needed both by varsity players and by golf classes in physical education. The plan provides for a large parking lot close to the Stadium.

It is requested that this 160-acre tract be allocated to the Athletic Association for the construction of this golf course. It is needed now; it should be built as soon as it can be financed.

7. Use of a small area in the north end of the forestry has been studied as a small recreation center for mixed groups of students. Games, such as volleyball, shuffle board, archery, etc., could be provided. No trees need to be removed.

8. The major need for buildings for athletics at present is a new sports building. Such a building should provide capacity for 15,000 spectators

for basketball. It would, of course, be available for other large University audiences, such as, Commencement when our present gymnasium is inadequate. The building should also provide needed space for intramural sports in the form of offices, game rooms, locker rooms, etc. Plans in connection with this building should also provide for a revamping of our swimming pool facilities. Our present pool does not comply with State laws for use in high diving, nor are the facilities for sanitation satisfactory. The present arrangement of the pool with respect to dressing rooms and lockers is very inconvenient and undesirable.

This proposed sports building represents a large capital expenditure, for which a legislative appropriation would be necessary. It is requested that it be placed on the University's building program, for action at the earliest opportunity.

9. Further areas for intramural baseball diamonds and other playing fields should be developed. At present, convenient fields for students in Urbana are lacking. It is requested, therefore, that an area of land lying just south of the Forestry, fronting on Pennsylvania and Lincoln avenues, and containing 8 to 10 acres, be allocated to the Athletic Association for intramural use.

10. Tennis courts are now maintained by the Athletic Association at nine different locations on the campus. It is our plan to maintain these courts in all cases and to secure further sites for further courts whenever this can be done. During the past few months, the courts south of the Old Gymnasium have been entirely rebuilt and resurfaced, with new drains, curbs and fences. The East courts at the Stadium will probably receive attention next.

11. Considerable thought has been given to a recreational area away from the campus, for the use of the Student Outing Club. The region adjacent to the campus provides very little in the way of natural outdoor recreational facilities. There are no rivers, lakes, woods, or mountains. The nearest approach to any interesting outdoor country is probably in the so-called Pollywog region 25 miles east of Urbana. An area of several hundred acres of old strip mine territory could probably be acquired cheaply. Such outing facilities should include a lodge, serving as headquarters, with dining and sleeping accommodations, also facilities for swimming, boating, hiking, skiing, skating, picknicking, etc. Many colleges have facilities of this sort and their operation has been found very satisfactory. The principal use is over weekends and for various conferences.

12. When Huff Gymnasium was built, provision was made for the subsequent addition of a north wing. Such a wing would provide a number of small rooms which would be useful for exercise, sports and class purposes. However, such a wing could not possibly provide the facilities wanted in the proposed sports building of item (8), hence it is recommended that this building project be deferred until the facilities possible in the sports building have been fully determined.

13. Miscellaneous. There are a number of minor facilities needed in connection with the athletic program, which are now under consideration. These include completion of the construction of the basement in Huff Gymnasium, installation of sound-insulating materials in various rooms and completion of unfinished areas under the swimming pool bleachers in Huff Gymnasium, installation of wood floor in the east wing of the Gymnasium Annex and rehabilitation of locker and shower rooms in the Old Gymnasium. (See Project P.E. 3)

These items are mentioned merely as illustrations of the needs and shortcomings of our athletic facilities.

This report is presented with the thought that with a more detailed knowledge of our plans, the Board of Trustees will be in a better position to view the athletic program in its proper relation to the other functions of the University.

Prepared by: Seward C. Staley
Director of School of Physical Education

PROJECT P.E. 6

OFF-CAMPUS RECREATION AREA

One of the major deficiencies of the Champaign-Urbana campus is that the country-side surrounding the campus--one of the great farming areas of the nation--does not provide any natural outdoor recreation facilities--forests, rivers, lakes, mountains, and the like. Many other great universities--for example, University of Wisconsin, University of Colorado, University of Indiana, University of Minnesota--in contrast, are surrounded by facilities of this type.

Three years ago a subcommittee of the Senate Committee on Athletics studied this matter and made a report recommending the purchase of an outlying area that could be used for outdoor recreational purposes. This report was duly forwarded to the Board of Trustees but, owing to the war, the project was tabled. It is hoped that the project will be revived at the conclusion of the war. The area recommended for purchase in the study referred to above may not be available at the conclusion of the war, but this should not be considered as grounds for abandoning the enterprise. The need remains. And other areas will serve the purpose.

It does not appear to be necessary to present here a detailed report regarding the needs and uses for an outdoor recreational area. The essential aspects of the project, however, may be outlined briefly as follows:

1. Topography.--The area should be comprised principally of rough country including hills, valleys and forestation. It should be located on a stream. If possible it should include a lake. This might be provided by the construction of an artificial pond.

2. Size.--The area should be large enough to accommodate a peak load of at least 1,000 visitors participating in a variety of activities. It

appears that 300 or 400 acres would be required to serve the purpose adequately.

3. Distance.--The area should be located between 10 and 30 miles from the campus. This would permit students and others to bicycle to the area in an hour or two. Automobiles could make the trip in from thirty minutes to an hour.

4. Financing.--Apart from principal required to purchase and develop the property, the area could be made self-supporting. This could be done through charging a small admission fee and charging for services. The area, once created, thus, would not constitute a constant expense to the University.

5. Facilities.--The area could be developed to include the following facilities:

Lodge to provide eating and lounging facilities including lodging accommodations for winter use.
Conference building with 2 or 3 rooms for group meetings.
Cabins. 10 cabins for 2 people, 6 for 4 people, 4 for 8 people to house guests over night, weekends, and longer periods.
Outing club lodge to provide simple accommodations for groups providing their own food.
Garage and tool house.
Caretaker's quarters.
Swimming pool.
Bath house.
Boat house for canoes, boats, etc.
Camp grounds.
Picnic ground.
Trails.
Playing fields.

6. Uses.-- The area could be used for the following purposes:

Outdoor recreational activities by students, faculty, alumni, and guests. The area would be used for this purpose by these groups on weekends mainly, during the entire year, but it may be assumed that the area would be used to some extent during the rest of the week also.

Special parties and affairs by the students, faculty, alumni and guests. Fraternities, sororities and student clubs would use the area for evening affairs throughout the year.

Undergraduate student instruction. The area would be used for inspection trips in connection with courses in zoology, entomology, botany, forestry, and geology. The School of Physical Education could conduct a summer course in camping. The College of Engineering might use the area for a summer course in surveying. The College of Fine and Applied Arts might use the area for a summer course in Art.

Graduate student and faculty experimentation and research. Special projects might be carried out in the fields of zoology, botany, forestry, entomology, and landscape architecture.

Small conferences and committee meetings. The grounds could be used for a wide variety of special functions such as alumni reunions, departmental picnics, state and national committee meetings, state educational conferences, 4-H Club camps, and agriculture group meetings.

7. The area should be developed to provide opportunities for participation in the following recreational activities:

Hiking	Boating	Volleyball
Camping	Picnicking	Paddle Tennis
Fishing	Nature walks	Tennis
Canoeing	Softball	Badminton
Swimming	Horshoes	

In closing it seems desirable to point out that at least 48 colleges and universities own or lease areas of the type suggested here. These institutions report that the areas have tremendous educational and recreational value.

Prepared by: Seward C. Staley
Director of School of Physical Education

SECTION 9

PROJECTS PROPOSED FOR THE

GENERAL UNIVERSITY PROJECTS

SECTION 9

PROJECTS PROPOSED FOR

GENERAL UNIVERSITY PROJECTS

GENERAL COMMENTS

Several projects which have been proposed would not fall under the jurisdiction of any College or School but are of interest to the entire University.

The University bands are made up of students from all branches of the University, the Library is really the heart of the University and renders service to all members of the staff and student body, the activities of the Dean of Students enter most phases of student life, the Health Service's activities are University wide, residence halls for men and women provide housing for students regardless of their academic program, and the power plant supplies heat and power to all campus buildings.

Projects concerning these and other general phases of the University program are presented in this section.

Prepared by: W. C. Huntington
Chairman, University Building Program Committee

SUMMARY OF PROJECTS

PROPOSED FOR

GENERAL UNIVERSITY PROJECTS

Number		Estimated Cost, Floor Area, or Capacity	Page
Gen. 1	Band Building	$ 250,000	3
Gen. 2	Library Additions	1,000,000	8
Gen. 3	Quarters for Dean of Students & Staff	12,600 sq.ft.	15
Gen. 4	University Health Service	16,000 " "	21
Gen. 5	University Press Building	57,000 " "	26
Gen. 6	Residence Halls for Undergraduates. .	2,000 persons	44
Gen. 7	Faculty Graduate-Student Center . . .	$ 1,000,000	48
Gen. 8	Additions to Administration Building	800,000	51
Gen. 9	Receiving Station & Warehouse	-------	53
Gen. 10	Radio Station W-I-L-L	10,000 sq.ft.	55
Gen. 11	Addition to McKinley Hospital	$ 200,000	61
Gen. 12	Large Auditorium	7,000 persons	64
Gen. 13	Extension Division Headquarters and Continuation Study Center	-----	65
Gen. 14	All-Sports Building	-----	68
Gen. 15	Addition to Power Plant	-----	72

PROJECT GENERAL 1

BAND BUILDING

The University Military Bands Department normally maintains four band units, including three military band units and a Concert Band, with a total membership of 360 or more. This represents approximately one-half of the candidates for places in the bands. A great many have stated that that was the deciding factor in their coming here.

The standards and various activities of the bands are well-known. Suffice it to state that they function as a service department, as President Kinley described it, cooperating primarily with the Military Department, but also the School of Music, the Athletic Department and Radio station WILL. They are subject to call for official University functions, play numerous concerts for the entertainment of the University and adjacent civic communities and respond to requests by alumni groups, etc. for concerts in other cities.

For service in the bands the members receive military credit. Normally the band work takes the place of all the required military. However, during the present emergency the band work takes the place of half the required military drill.

The director's policy has been to bring the members of the bands into contact with a large amount of the best in band music, has personally transcribed many symphonic works otherwise unavailable, and endeavored to provide professional-like experience and routine.

However, most of the members are interested in the band work as an avocation rather than a vocation. They grasp the opportunity to take part in the band activities along with their various courses. Registration by

colleges in a typical year was as follows: L.A. & S., 131; Commerce, 73; Engineering, 69; Agriculture, 22; Education, 1; F. & A.A., 62; Law, 1; Graduate School, 4.

Urgent need for a new Band Building was conclusively established several years ago. The University Board of Trustees included it in its biennial budget requests for the last biennium and the state legislature concurred wholeheartedly by appropriating $125,000 for the new building. Complete detailed plans were drawn by the University architect and his staff, ready for construction. Unfortunately, lack of priorities made it impossible to secure building materials so that construction had to be deferred and the residum of the appropriation allowed to lapse.

On the occasion of the inspection by the General Assembly in April 1941 the University presented the following statement:

" The present Band Building was erected in 1917 for military purposes. It is of temporary frame construction. In 1928, after the Armory was completed, this building was remodeled and turned over to the Band Department which has been housed there since that time. It is inadequate in size and unsuitable in design and construction for use of the bands. The four band units, with a total enrollment of 350, each meet in this building for rehearsals several times a week. In addition to these general rehearsals, the building is used for sectional rehearsals, individual tryouts and periodical examinations for assignment, promotions, etc.

At various times during the year, the Band Building houses important meetings of state and national scope. The annual band clinics, which originated here, bring about 500 of the leading bandmasters, particularly school bandmasters, into the Band Building where most of the meetings are held.

Since the building is of inflammable construction, there is always danger of the loss by fire of valuable instruments and musical scores.

A new building should be constructed to remove the fire hazard, to provide a larger and properly designed rehearsal room with space to accommodate clinic audiences, and to provide practice rooms for band members, locker space for instruments, storage rooms for trunks, adequate space for the band library and special rooms for the Sousa Library and the Carl Busch Collection of instruments."

The condition of the old building is now even worse and is generally described as a disgrace to the University and not worthy of this department. In addition to the fire hazard, dust and dirt sifts in through walls, windows, crevices, etc.

In many respects it is overcrowded. The band library has outgrown its original quarters and has had to be scattered throughout the building in corridors, in the offices, examination room, and rehearsal room. This not only takes up needed office space but causes confusion.

The instrument locker room, always inadequate, is badly congested. There is need for at least three times the present number of lockers for the larger instruments which cannot be conveniently carried back and forth.

The storeroom for instrumental equipment is also overcrowded and facilities for properly safeguarding the equipment is lacking. There is also a total lack of "dead" storage for instrument trunks, shipping cases, etc. Many of these are now having to be stored in the University library basement and the Armory. Again, there is need for at least three times the present space.

In the uniform room a makeshift double-deck arrangement has had to

be contrived to take care of the 200 band overcoats, uniforms and various accessories.

All of this has necessitated an overlapping of quarters for band equipment and has made it difficult to localize responsibility for the equipment. An instrumental repair shop is much needed. A makeshift arrangement is now crowded into a corner of the instrument room.

There is a total lack of individual practice rooms and other small rooms needed on occasions when the bands are divided up and rehearsed in detail by sections at the same hour.

The new building should by all means provide a suitable suite of rooms for the famous Sousa Band library which the great bandmaster so generously bequeathed to the University. It is temporarily installed in a suite of rooms in the main Library building where it is taking up needed space and is a source of inconvenience, necessitating innumerable trips by band librarians between the two buildings.

Suitable quarters are also needed for the valuable Carl Busch Museum collection of old instruments which is also temporarily housed in the University main library. A large room equipped with display cases should be provided to display this valuable collection as well as the Bands' own collection of unusual instruments.

The sole redeeming feature of the old building is its location, which is ideal for the various band activities. Adjacent to the Armory, it is convenient for the weekly retreats and other military ceremonies, especially during inclement weather. Also nearby is the specially-marked band drill field necessary to the drilling of the bands in special formations. Both of these are vital time-saving factors, as well as safeguards to equipment. The new building should, by all means, be located here.

As to post-war development, consideration first must be given to the return to normal enrollment and activities. In addition there will be an inevitable increase in enrollment, which will necessitate taking care of returning veterans as well as new students. There will also be the resumption of the Bands Department activities in sponsoring state and district contests previously held on the campus, as well as the various meetings of state and national scope. In a recent letter received from the Executive President, National Board of Control, Music Educators National Conference, he made the following statement: "As I have said to you before, you and your organization were the spring-board from which we started the original (school) band movement, and it also must be the one from which we start our comeback."

As previously stated, all data concerning floor area, type of construction, etc. are contained in the completed plans for the new building and are available in the University architect's office in the Physical Plant department. He states that this should meet the needs of the committee.

Prepared by: A. A. Harding
Director of Bands

PROJECT GENERAL 2

LIBRARY ADDITIONS

I. INTRODUCTION

For the past several months the administrative staff of the University Library has been engaged in a study of post-war library building needs. The delay in submitting recommendations to the Building Committee for expanding the library building is not indicative of a lack of urgency but rather the result of the changes in the library administration which occurred in the fall of 1943. Actually, the need for building additions is most urgent if adequate library service is to be given after the war. In a number of ways the library has outgrown its present quarters and provision should also be made for several new activities, described below. The rapid filling of space now available is a reflection of the active efforts made to build up the book collection, and in general to develop here a great research library.

A large increase in the University's enrollment following the war is certain. This fact, added to changes in methods of instruction, heavily emphasizing library research and study, will undoubtedly result in more intensive use of the library than ever before. Prior to the war the library's reading room facilities were often filled to capacity and we should be prepared for even heavier demands in the post-war period.

Following is a list, with explanatory comments, of some library services and facilities requiring additional space.

II. ADDITIONS TO MAIN BUILDING

1. Acquisitions Department;--This department shares a room with the Catalog Department. The Acquisitions Department has outgrown its quarters to

such an extent that one division, periodicals, has had to be located on another floor. When the Acquisitions Department was established in its present location, it had 16 assistants; it now has 26. It then, in 1927, spent $112,000 for 15,000 titles annually. Now it spends $165,000 for 29,000 titles. Checking serials constitutes an important part of the work; in 1927 there were 6,000 titles checked and in 1942-43 nearly 13,000. In the present quarters there is no room for additional equipment or records and the building provides no opportunity for expansion.

2. Catalog Department.--As noted above, space is shared with the Acquisitions Department. The standard requirement for each cataloger is 100 square feet of work space. In 1927 each cataloger had 115 square feet; now only 75 square feet is available. Actually, columns, shelves, counters, and aisles reduce the area to a point less than this and considerable below the standard for efficient work. One branch of the Department, the Card Division, has had to be located on another floor. An important part of the library is the Union Catalog maintained by the Catalog Department and used by graduate students and faculty as well as by the staff for locating books in other libraries throughout the country. This file grows at the rate of 100,000 cards each year, requiring 10 square feet annually for expansion. No space is available in the present building for expanding the Catalog Department, for consolidating the Card Division with the Department, or for expanding the Union Catalog.

3. Library School.--In the years immediately preceding the present war, enrollment in the Library School was so heavy that classroom space had to be found elsewhere on the campus, study space was too limited to accommodate more than 50 per cent of the students, and there was a shortage of

faculty offices. Indications are that the demands for training will be substantially greater at the end of the war for the following reasons: the Veterans Administration is asking the School to undertake a program of training hospital librarians; librarians now in war service will return for refresher training; a considerable number of war veterans, particularly those with specialized subject training are expected to enter the library profession; an acute shortage of trained librarians exists because of reduced library school enrollments during the war years; and the Library School is being called on increasingly to teach the use of library materials to such groups as occupational therapy and social administration students. All these needs must be kept in mind in planning more space for the Library School.

4. Business Records Library.--This collection, now housed in the basement and a number of other rooms in the College of Commerce building, should be in the library building if space were available. Transfer would release space for other purposes in the Commerce building. The collection supplements material in the general library and would be more effectively and economically administered if it were part of the main library. Its usefulness would be increased by housing in space adjacent to the present Commerce Library.

5. Illinois Historical Survey.--A similar situation prevails with reference to this collection, now on the fourth floor of Lincoln Hall. The extensive collections of source materials for western history supplement those in the general University Library. Placing them in proximity to the History Reading Room and the historical sections of the main library book stacks would greatly facilitate study and research.

6. University of Illinois Collection and Archives.--For some years the Library has collected all available printed and manuscript material relating to the University. A beginning has also been made in developing an archival collection, consisting of the official correspondence and other records, no longer in active use, of all administrative and teaching departments on the campus. Limitations of space have prevented a more ambitious program of collecting, and consequently the files of some offices have been discarded and lost. Because of the importance of such records for the University's history, provision should be made for their preservation in the Library.

7. Rare Book Room.--The Library is estimated to contain 40,000 volumes classifying as rare books. Lack of space has prevented bringing these books together and segregating them where they can be guarded and their use carefully supervised. The present Rare Book Room is small, poorly lighted, and badly ventilated. The facilities needed include improved study space for those engaged in research requiring the use of rare books; adequate space for shelving rare material with temperature and humidity control; a vault for the most valuable books; and a gas chamber for freeing rare books from destructive mold and insects.

8. Bindery.--Organization of a library bindery has been under consideration for many years. It was recommended by the faculty Committee of Nine in 1931, and in 1935 an appropriation was not sufficient for the purpose, however, and action was postponed. Because of unusual difficulties encountered with the state binding contract in 1941, the question again arose and Mr. Morey and Mr. Edwards felt that installation of a bindery would solve some of our present binding problems.

Among the advantages of having a bindery in the University Library are these: if the binding were done in our own building, the books would be

available within a very short period, they would not be subject to the wear and tear of packing and shipping, and certain classes of material could be rushed through on short order. We would also be able to do necessary repair work on rare books, and to do more efficiently ordinary repair work needed to keep our book collections in good condition. Other functions would be to bind pamphlets in large numbers, mount and repair plates, maps, manuscripts, etc.

It is estimated that establishment of a bindery would require about 2,500 square feet of space, preferably on the first floor or basement. No space is now available.

9. Periodical and Newspaper Reading Room.--No satisfactory space can now be found for the use of newspapers and periodicals, particularly current files. A suitable place to use the excellent collection of bound newspapers is a paramount need and additional space for normal expansion of the collection is also required. A newspaper reading room could be satisfactorily combined with a room for general periodicals.

10. Microphotography Facilities.--Microphotographic reproduction has become an essential adjunct of literary and technical research. Greatly expanded facilities will undoubtedly be required after the war, when foreign libraries are reopened. It is also desirable to do photographic copying in the Library to avoid sending rare books out of the building and for speed and promptness in getting the work done. The anticipated increase in the use of microfilm will require space to store film as well as room for using projection machines. Present quarters for these functions are inefficient and inadequate. From 1000 to 1200 square feet, perhaps in the basement, would be needed.

11. Browsing Room.--The present Browsing Room on the second floor is a temporary arrangement. The space it occupies will soon have to be vacated for expansion of the public catalogs, for which it was originally planned. The browsing collection is one of the most used and appreciated facilities in the Library.

12. Undergraduate Reading Room.--President Willard, Provost Harno, Dean Carmichael, the Faculty Committee on Library Service to Undergraduate Students, and others have recommended that careful consideration be given the matter of improved library service for undergraduates. Apparently this need can best be met by providing an undergraduate reading room, containing a carefully selected collection in all fields of perhaps 10,000 volumes, and with seating space for not less than one third of our normal Freshman-Sophomore enrollment.

13. Map Room.--A map librarian has recently been appointed and plans are under way to organize and make available the large collection of maps now scattered in different units of the Library and of the University. Probably provision should also be made in this room for a working library on geography for the use of students in geography and other departments.

14. Administrative Offices.--Only makeshift offices are now available for the Associate Librarian and for the Assistant Librarian for personnel. The work of these officers is thereby hampered, and staff, students, and faculty members who must consult with them are inconvenienced. The Director's office should be expanded to include space for these two administrators.

To provide for the above facilities and services, it is recommended that additions to the present library building be constructed, consisting of an extension 92 feet long, at the north end, and a similar extension at the south end of the building.

It will also be possible to make more adequate provision for some of the Library's present activities, by a reallocation of space, when the two proposed additional wings have been constructed.

III. ADDITIONAL STACK SPACE

A survey of the present stacks shows that on all floors the limit of expansion will be reached by 1946. It is estimated that about 60,000 volumes or one mile of books are added to the stacks annually. The Library is approaching 2,000,000 volumes in size, more than three fourths housed in the main building. The present stacks were designed to hold only 1,500,000 volumes. A considerable amount of space is also required for current and unbound periodicals, college catalogs, pamphlets, textbooks, and government publications--not included in our count of volumes. Also, as departmental libraries on the campus become crowded for space it is their practice to weed out their collections and return less active materials to the main library for shelving. Another service provided in the stacks is individual study cubicles for graduate students and faculty members. The present 222 cubicles have proved insufficient to meet the demands even during the war years.

To meet expansion needs of the next 15 years, two new stack units, designated as fourth and fifth, should be added. Each unit provides space for shelving approximately 500,000 volumes. When a stack unit is erected, it is necessary to shift the entire book collection -- a time-consuming and expensive operation. For this reason as well, as for economy in construction, it is desirable to build the two stack units simultaneously.

IV. MODERNIZATION OF EQUIPMENT

1. Lighting, Heating and Ventilation.--According to present standards, lighting in the first and second stack units and in certain offices is

now sub-standard. All lighting should meet present day standards. More satisfactory heat control should be provided in the present stacks and in certain large staff work rooms. Ventilation in these same areas should be improved.

2. Air Conditioning.--Provision should be made for air conditioning of the public service departments, and similar treatment for offices, work rooms, and stacks would be highly desirable.

3. Elevators.--The main library elevator should be replaced with a more rapid car and up-to-date equipment generally. The automatic elevator in the present third stack unit is frequently out of order and should be equipped with more satisfactory operating mechanism. In fact all library elevators require reconstruction.

4. Soundproofing.--A number of the public service rooms, offices and large staff work rooms should be equipped with sound absorbing ceilings.

V. ESTIMATED COSTS

1.	Additions to Main Building	708,000 cu. ft. @ $0.62 =	$439,000
2.	Additions to Book Stacks		650,000
	Total		$1,089,000

Prepared by: R. B. Downs
Director of the Library

PROJECT GENERAL 3

QUARTERS FOR DEAN OF STUDENTS AND STAFF

I. INTRODUCTION

In a recent letter to you, I made the suggestion of the possibility of planning for the central housing of all of our University offices dealing with student life and welfare. In general this would provide for the housing of all of the offices and most of the functions which were incorporated in our Dean of Students organization which was established on August 31, 1943. At that time, the Board of Trustees appointed a new general University officer, the Dean of Students, charged with the responsibility of assuming the recognition of the broad responsibility for the entire life of the student while he is living in the academic community, with the objective of providing the optimum conditions for his academic endeavors. The Dean of Students was placed in charge of and asked to unify and coordinate all agencies interested in the students' physical well being, both in living quarters and personally, in their social and recreational activities, and in the improvement of the cultural level of all phases of student life outside the classroom.

Existing officers who were placed at once in the organization of the Dean of Students included the Dean of Men, including all of his functions, the Student Employment Office, the Dean of Women, the Division of Student Housing, social, educational, and cultural programs in the Residence Halls, all phases of student activities, and the Health Service Station. Certain other functions were included, but these functions are carried on in buildings primarily intended for the purpose, and need not be considered in this statement. All of the aforesaid offices and functions are housed somewhere at the present time, and this recommendation that they be placed in a special central building for

efficiency and convenience is divided into two parts, one considering all of the offices concerned except one, the Health Service, the other devoted entirely to the Health Service. (See Project General 4) This division is made for the reason that the need for rehousing the Health Service is perhaps one of the most pressing needs we have at the present time, and deserves special mention throughout this memorandum. The various offices concerned including the Health Service, could be housed in one building, provided a design giving special entrances and more or less separate units for the Health Service were provided; it might seem wiser to house the Health Service in a separate building, but if this were done, it should be very close to the building housing the other offices of the division of student life and welfare, and possibly connected by tunnel, ramp, or corridor.

II. FUNCTIONS OF THE VARIOUS DIVISIONS

1. Dean of Students.--The Dean of Students is the supervising, unifying, and coordinating officer in charge of all agencies interested in the students' physical well being, both in living quarters and personally, in their social and recreational activities, and in the improvement of the cultural level of all phases of student life outside the classroom. He is charged with the broad responsibility for the entire life of the student while he is living in the University Community, with the objective of providing the most favorable conditions for the academic endeavors of the student. His appointment, and the creation of the administrative unit on the campus is the result of several careful studies, and the organization is strictly in line with modern educational practice.

2. Dean of Men.--Is the general adviser for men. His duties are advisory and not regulative. His functions include personnel work, vocational direction, and guidance in all problems involving intellectual, emotional, and social adjustments.

He and his staff serve as general advisers, and as a clearing house for almost every variety of student problem. He works with individuals, with organizations, with fraternities, and with faculty-student relations. Almost any type of student problem may have preliminary consideration in the Office of the Dean of Men, and from there either be settled or referred to the proper office for handling.

3. Student Employment Office.--Is maintained for the express purpose of assisting students who must seek work for financial assistance to enable them to continue with their educations. The office registers applicants, classifies them according to their abilities and aptitudes, and places the students in temporary or permanent jobs. Continuous employment records are kept of all student workers. Student workers on University payrolls are certified through this office. In addition, the employment office serves as the central placement office for the placement of students and alumni in cases which cross department and college lines and where placement officers are seeking workers regardless of their special preparation.

4. Dean of Women.--Serves in the same capacity for student women as does the Dean of Men, as described in No. 2.

5. Division of Student Housing.--Was established to accomplish two objectives; to serve as a central listing office for all student living accommodations, except Residence Halls operated by the University, and to establish standards for these accommodations which would meet all accepted and recognized standards for living facilities.

6. Residence Halls Department.--Serves, in normal times, as the renting and operating agent for all University-owned residence halls for men and women. The Dean of Students is not charged with the operation of the halls but is with the social, educational, and cultural programs in these halls.

7. Conference Rooms.--Numerous conference rooms are in constant demand for student meetings (which have already exceeded the space available in the Illini Union) for Faculty-Student Meetings and Conferences, for Placement Officers who visit the campus, and numerous other miscellaneous meetings which constantly take place on the campus.

III. DEPARTMENT LOAD

A general statement covering all offices involved under the Dean of Students Organization will cover this matter. In years of normal registrations, these offices all seemed to be operating to capacity with present space and equipment. With reduced war time registrations, it would be logical to assume that the business load of these offices has been reduced proportionately. Such is not the case, however; and all of these offices operate at capacity all the time, in spite of the lowered registration. If the registration should increase as predicted, it would become essential that space for additional assistants in every office be provided.

IV. PRESENT SPACE

1. The Dean of Men and Dean of Students occupy 1950 sq. ft. of space on the first floor of the Administration Building, West.

2. The Employment Office has 1120 sq. ft. of space on the first floor of Administration Building, East.

3. The Dean of Women has 1540 sq. ft. of space in the Woman's Building.

4. The Student Housing Division has 1030 sq. ft. on the first floor of Illini Hall.

5. The Residence Halls Division has 1000 sq. ft. of space on the first floor of Illini Hall.

6. Conference rooms, are exceedingly scarce and at a premium even with the reduced registration.

V. POST WAR DEVELOPMENT

The establishment of the Office of the Dean of Students was made on the following bases: "It is planned to proceed gradually in transferring various agencies dealing with the extracurricular life and activities of students so that the new officer may have time to study and take over his new responsibilities effectively." While certain offices listed above were transferred at once, there is still a considerable amount of study necessary before making final disposition of certain departments.

It seems clear and logical that these offices could be housed more efficiently in the same building, than scattered through three as they are now. Furthermore, the quality of the space for certain of these offices is definitely substandard, and since these offices are the first ones visited by most new students and their parents, a much better impression of the University would be gained by these people if they were handled more efficiently and in more attractive office space.

VI. PROPOSED NEW SPACE

It is estimated that the floor areas needed for these offices in a new building are as follows:

Dean of Students	1500	sq. ft.
Dean of Men	2000	" "
Employment Office	1200	" "
Dean of Women	1500	" "
Student Housing	1200	" "
Residence Halls	1200	" "
Conference Rooms	2000	" "
Other Offices(not yet assigned)	2000	" "
	12600	sq. ft.

It is highly desirable that, as soon as possible, the Dean of Men and Dean of Students be separated, and individual office spaces provided for each. At present, we are managing to get by, but we constantly get in each other's way, and there is constant confusion as a result of the present setup.

VII. SUMMARY

It is recommended that 12,600 square feet of floor space be provided in a remodeled, new or new wing of a building, so that all of the offices coming under the Dean of Students can be housed centrally and more attractively.

Prepared by: Dean Fred H. Turner
Dean of Students

PROJECT GENERAL 4

THE UNIVERSITY HEALTH SERVICE

I. INTRODUCTION

The Health Service provides for the extensive application of the principles of preventive medicine and sanitation in seven different but more or less related fields of health promotion and disease prevention.

1. Provision of a Healthful Environment.--Students must have wholesome surroundings if they are to escape epidemics, the annoyance of nuisances, the dangers from fire. A safe water supply, proper disposal of sewage, clean, pasteurized milk, and carefully inspected food are essentials of good living conditions. Adequate protection for those handling injurious substances, using lethal gases, or coming in contact with plants or animals capable of producing disease, is an important consideration in the provision of a healthful environment.

2. Health Examination.--A health examination of "all students entering the University for the first time" has been required since action by the Board of Trustees on March 12, 1918. It serves as an inventory of the physical and mental health of students, and provides the information essential for their classification for military training and physical education, and the correction and alleviation of defects and abnormalities.

A medical examination makes possible the diagnosis of disease in its incipiency, the prompt institution of treatment, and the taking of immediate action for the control of communicable disease.

3. Prevention and Control of Communicable Disease.--The Health Service uses every practicable means to prevent and control communicable disease among students, faculty, and employees. This effort reduces sickness and death

rates from preventable disease to the minimum. It is based upon the sound economics of keeping the greatest number of students possible in the classroom.

Immunization against smallpox and typhoid fever has been continuously promoted by a campaign of education.

Early diagnosis of communicable disease is essential in the prevention of its spread.

4. First Aid in Accident and Illness.--The Health Service maintains a dispensary for ambulatory cases of accident or illness. This service is essential to detect communicable disease in its incipiency and to reduce to a minimum the danger of serious infections resulting from minor injuries. It promotes prompt hospitalization which does much to reduce the severity of illnesses and injuries so often caused by delay or neglect. Dispensary service also makes possible quick referral of the ill and injured to competent physicians and specialists.

5. Promotion of Mental Health.--The Health Service from its beginning has accepted as self-evident that students not only need sound bodies and sound minds, but also wholesome, disciplined emotions, and a keen sense of social responsibility. At the time of the physical examination, efforts are made to detect students who may be nervously unstable or who give evidence of being maladjusted.

6. Health Education.--As the functions of the Health Service of Illinois are primarily preventive and educational rather than therapeutic, sustained efforts are made to encourage students to acquire good health habits and to adopt an attitude towards personal and community health which will carry over into life and prove an advantage to them, their families, their communities, and the Nation.

Emphasis has been placed on the attainment of good physical health and mental toughness essential to meet with equanimity the vicissitudes of life, to withstand the strenuousness of the times, and to insure social vigor. Through education in personal and community health, effort has been made to give the leader of tomorrow the knowledge, awareness, and desire necessary to participate intelligently in enterprises for the promotion of the welfare of the community in which he lives.

7. Health of Personnel.--In institutions of higher learning, as in the primary and secondary schools, it has been recognized as of paramount importance that the health of personnel, whether professional, skilled, or unskilled, should receive close attention, so that they will not be a source of disease, shall possess the vitality essential to pursue their work effectively and shall set an example of vigor and accomplishment.

II. DEPARTMENT LOAD

On March 18, 1918, the Board of Trustees passed a regulation requiring all new students to be examined on matriculation. There were 3,214 students examined that year. The number of students given physical examinations has varied from 3,131 to 5,456, most of them coming to the campus for the purpose at registration time. The number of calls to the Health Service has ranged from 7,262 to 85,650 per year. How many times an individual will call for service or advice is governed by several factors. For example, in 1938, during a period of nine days there were 22,686 visits made to the Health Service because of a threatened smallpox epidemic.

During 1943, in addition to the visits made by students and employees, Army trainees now stationed on the campus made 38,290 visits for medical service between April 1, 1943, and February 1, 1944. Visits increase as the en-

enrollment in the University increases, and as the service of the Health Service is expanded to meet greater demands upon it.

III. PRESENT SPACE

The present Health Service, with 9,860 square feet of space, was built 50 years ago as the residence of the President of the University. It was not built for use as offices for physicians. It is poorly arranged resulting in much waste space. On the first floor are four large rooms serving as offices for nine male physicians, a small hall way and a part of an adjoining room have to serve as a waiting room and desk space for files and clerks. The offices are too large for highest efficiency and the waiting room and desk space, far too small. Storage space is ill arranged and too small.

The second floor houses three physician offices, a women's waiting room, the main office and two small rooms. The two small rooms are used for storage of files, a large apparatus for testing of automobile drivers and as a place for clerks to work. The space provided is totally inadequate and frequently it is necessary to have student clerks working on the third floor which is of attic construction.

The entire building of frame construction is a fire hazard.

IV. POST WAR DEVELOPMENT

The trend towards more adequate medical care of students, employees, and faculty, together with the anticipated increased University enrollment will materially increase the number of calls at the Health Service Station and emphasize its inadequacy for the purpose for which it is being used.

V. PROPOSED NEW SPACE

The present building offers little solution to its present problem of inconvenience and inadequacy. The cost of remodeling the Health Service Station to provide modern offices for physicians would cost more than the present building is worth. Either a new building, or space in a new wing or building, allowing for at least 16,000 square feet of space should be provided. If it were to be a wing of a new building or addition, separate entrances should be provided, but access by corridor or ramp should be possible from the building housing other units of the offices of the Dean of Students and his related offices.

VI. FUTURE DEVELOPMENT

The increase in the service of the University to the State, the realization of its airport, the great expansion of the work of the Health Service by the action of the Board of Trustees, and the obvious trends in the application of science to the promotion of health and the prevention of disease make better provision for the Health Service imperative if its function is to be at the high standard which should characterize the work of a great University.

VII. SUMMARY

A new building or part of a building should be provided for the Health Service Station, to provide at least 16,000 square feet of space. This should be a part or have easy access to the building which houses other welfare and service offices interested in student life.

PROJECT GENERAL 5

UNIVERSITY PRESS BUILDING

I. INTRODUCTION

The University Press was officially organized in 1918, following several years of study and discussion, during which time the editorial and printing work was under the supervision of the Assistant Registrar. The University Statutes (Sec. 22) provided that the Director of the University Press "shall have charge of the work of editing, printing, and distributing the publications of the University."

The Board of Trustees, in adopting this regulation, had in mind the advantages and economics of a unified direction and control of our printing and publishing activities. The administration and the Board have in recent years become increasingly aware of the importance of these activities. In 1940, a committee of the faculty, with Dean Carmichael as Chairman, was appointed to study and make recommendations looking to the development of a program of the publication of scholarly books.

The Director of the Press visited all the important university presses east of the Mississippi River, and his findings were made the basis of a report to the President looking to the better organization and support of the Press. Appropriations for the publication of scholarly books for 1943 were $25,000, and for 1944, $15,000. With these funds seven books in eight volumes, a total of 4348 pages, were published in 1943 and early in 1944. Two complete books and the major part of a third (1446 pages) were printed, but not bound, in our own plant. The entire work of editing these manuscripts for the printer, designing the formats and the bindings, placing the contracts, and seeing the books through the press was assumed by the Director of the Press. This was

possible only through the most active, loyal, and intelligent cooperation by the Superintendent and his force and by the several authors. For 1944, three volumes have been approved and the work is in progress.

The sale of such books is slow, and storage facilities must be provided for a large stock.

The Board of Trustees in 1941 appointed Mr. John R. Fornof as a special committee to consider the proper development of the Press, Mr. Fornof reported on November 18, 1941, and the "Director of the University was instructed to formulate and present a long-term program for the development of the Press." This matter has been the subject of study ever since.

During the year ending June 30, 1943, the total cost of labor and materials in the University Press was slightly under $150,000, on a net basis, not including any charges for rent, insurance, taxes, profit, etc. On a commercial basis, this would represent a business of the order of a quarter of a million dollars a year. This includes such major pieces as the Annual Register, Reports of the Board of Trustees, Time Tables, directories, college and departmental bulletins and circulars, agricultural and engineering experiment station publications, and the stationery, blanks, and other printed matter necessary in the operation of the University. These needs increase with the growth and expansion of the program of the University, and require increasing investment in machinery and equipment and growing personnel in all branches of the Press.

II. BUILDING FOR UNIVERSITY PRESS

A building for the University Press should house under a central and unified direction all its activities, including the editing, manufacture,

storage, and distribution of its publications. It should provide space for other related services, such as mimeographing, addressing, photography and blueprinting, and office supply and paper stock. Such a building might be a T-or L-shaped structure, with a one-story wing for the manufacturing plant and paper stock, and with close connections to the mailing and storage rooms.

The argument for more space for all our departments and branches may be summed up in the statement that the Press has never had adequate and suitable space to provide for its staff and equipment and for the work it has had to do without any consideration of future growth. The plant is now located in a basement, with insufficient space for its present volume of work. The proof-readers attached to the shop are located on the third floor, away from the Superintendent's office, and also separated from the Director's office. The Director's and editorial offices are much overcrowded as well as improperly arranged for the kind of work to be done.

III. THE NATURE OF EDITORIAL WORK

Editorial work requires intense concentration. It is necessary that all persons engaged in this work be given adequate space and that they be protected from noise and from interruption. It is highly desirable also that they be able to spread their material around and to leave it without danger that it will be moved or disturbed. Editors must hold conferences with authors and representatives of departments. For these reasons, editors should have a private office or workrooms, with space for desks, typewriters, and work tables. They should have also access to conference rooms, which should be clear when not in use, for consultation when their own rooms can not be used for that purpose.

Cubicles should be provided for authors who wish to work on manuscripts, proofs, etc.

Similar cubicles should be provided for teams of proofreaders and copyholders.

The public office should be large enough to accommodate the office manager, with her assistants, and also to provide space and chairs for persons waiting to confer with the Director and members of the staff. Considerable thought should be given to the location and arrangement of this room and its relation to the several offices for which it will be the public entrance.

IV. SUMMARY OF SPACE NEEDED

The following estimate of space needed is based on a consideration of the needs of our present staff and functions, with some thought for the future. The needs of the manufacturing department have been covered by Mr. C. E. Herman, Superintendent, in a report dated February 5, 1944, which follows this statement.

A summary of the space needed follows:

	Square Feet
1. Central public office, with Director's and editorial offices, etc.	5,000
2. Storage of books and periodicals	5,000
3. Central mailing room, addressographs, mimeographing, stenographic bureau, etc.	5,000
4. Manufacturing	25,000
5. Paper stock, supplies, etc.	12,000
6. Photography, blueprinting, photostating, and similar processes	5,000
	57,000

V. DESCRIPTION OF SPACE NEEDED

1. Directors office, Editorial offices, etc.--This includes public and private offices, conference rooms, authors' cubicles, reference library, work rooms, coat rooms, vault for storage of manuscripts, and other space for the Director, editors, University historian, assistants, and temporary help.

Advertising and sales, with their records, should be provided for in the main office. Thought should be given also to the relation of the Illini Union Book Store to the Press.

2. Storage of Scholarly Books and Periodicals.--These are not the creatures of a day, with wide popular appeal. On the contrary, they belong to all time, and their appeal is to highly restricted groups. They may not be considered on a commercial basis. They are slow-moving. It usually takes many years to produce the manuscript. After the manuscript has been completed by the author, extended conferences with the editors and printers will usually be necessary, so that many months may be needed for editing and printing, and usually it takes two years to get a competent review written and published. The costs of publications are great; the results are extremely valuable and worth while. No university can be regarded of the first rank unless it supports and promotes the publication of these works on a scale comparable with the size of its staff and their ability in research and the production of original material.

It is evident that the publication of scholarly works immediately involves the question of storage. Enough copies of the book must be printed to satisfy the demand for many years - during which the books must be stored in a safe and accessible space. The University of Illinois has not published a large number of books; yet we have no suitable space for storage; the space

we are using is mostly in basements, where there is danger of mildew if not actual flooding, and the books are not readily accessible. One of the main functions of a new building will be to provide space for the storage of books, with a work-room for preparation for mailing. Humidity control is desirable.

3. Mailing room, etc.--Many of the bulletins and circulars of the University are entered as second-class mail under the general title "University of Illinois Bulletin." This entitles mailing at a low rate of postage. It also subjects the mailing to the regulations established by the U. S. Postal authorities. It is highly desirable that a central mailing room be established for these publications. The utmost economy would be promoted if this mailing room could be adjacent to the bindery, so that the supply of bulletins for immediate mailing could be delivered there for addressing, sorting, packaging, and delivery to the post office. Convenient storage for a small supply to meet demands after the first mailing should be provided.

Addressographs, as well as mimeographing, stenographic, and similar service now included in the Information Office and Stenographic Bureau, should be included here.

4. Manufacturing.--See Mr. Herman's report. This is of course the largest single unit and presents the greatest need.

5. Paper Stock and Supplies.--See Mr. Herman's report.

6. Photography, Blueprinting, Photostating, and Similar Processes.--These functions not only involve reproductive processes, but some of them are intimately connected with the production of illustrative material for printing.

VI. LOCATION OF BUILDING

The location of the Press building is important. It should be as central as possible, for easy access to its facilities by many persons from all parts of the University; its Director and editors should be able to get to departmental offices, the Library, etc., with minimum loss of time. And of course close connection between the Director and the Superintendent, and between the editors and the plant are essential. This matter was the subject of study nearly thirty years ago, and the Board of Trustees purchased in 1917 a lot on Sixth street, Champaign, directly west of Davenport house, and assigned it as a site for the University Press. Time has not changed the desirability and convenience of this location. If the manufacturing wing could be built on the original lot, and connected to an office wing on the present site of Davenport House, the Press would be accessible to the colleges and departments, to the administrative offices, to both postal substations in the University district, and to the public.

Prepared by: H. E. Cunningham
Director of University Press

SUPPLEMENTARY STATEMENT

The manufacturing facilities of the University Press outgrew their present quarters several years ago. For the following reasons this condition should be corrected as soon as possible:

(1) Due to the daily strain on our facilities we are constantly faced with the possibility of <u>failing</u> to deliver important printed material on time.

(2) Our limited space does not allow us to follow efficient production practices.

(3) Electric lines are loaded to their limit, or practically so.

(4) We have no fire-proof storage for gasoline, alcohol, and other cleaners we must use.

(5) The printing plant produces considerable work of a confidential nature--at present almost any one and every one can pass in and out of our press room and bindery. (In line with full correction of this the Director of the Press should have control over all people connected with the Graphic Arts Building.)

(6) Humidity control (probably air-conditioning) should be provided for the subdivisions of the shop which handle paper, i.e., the press rooms, the bindery, the paper store room, and the room in which book stocks are stored.

(7) To quote Dr. J. Howard Beard, U. of I. Health Officer: ". . . the sanitary conditions of the shop are obsolete, and definitely more hazardous than the risks now associated with the printing industry under modern conditions." (Report of Dr. Beard to President Willard, dated January 24, 1941.)

The first column of the following table shows the space now occupied by the several subdivisions of the printing department of the University Press. The second column shows an estimated space which would allow each subdivision to handle its work efficiently up to considerable more than is being done.

It is obvious that the space suggested will allow for considerable expansion. (It is also obvious that in our present quarters we have only a portion of the space we should have.)

Approximate Present Space Occupied by Printing Department*
and
Estimate of Space Needed**

Department	Present Space* (sq.ft.)	Suggested Space (sq.ft.)	Increase Would Be (sq.ft.)
Office.	462	1200	738
Proof Room.	263	600	337
Composing Room. . . .	2000	6000	4000
Press Room.	1550	8000	6450
Bindery	1000	7000	6000
Offset Press Room . .	260	1500	1240
Wash Room	124	(Included in above)	
Total	5659	24300	18765
Office Supply	6400	13000	6600

* Present height of ceiling is 9'2".

** Suggested height of ceiling is 14'. (14' will accommodate machines of size needed to do our work.)

The following is a more detailed explanation of why additional space is needed and how the space would be used:-

Office.--The office space for the superintendent should be ample to comfortably accommodate any group who might call on him to discuss printing problems.

The assistant superintendent should be provided with space enough for two desks and a drawing table.

There should be space for a commercial artist. Considerable money could be saved and the University printing could be more effective if better designed. We do some very good work now--but there should be an over-all improvement.

There should be twice as much filing space in the office for cost records and other material which is now discarded too soon. We should keep them about two and one half years.

The details of our cost system take the time of three persons. At present two of these desks are directly adjacent which does not promote efficiency.

There should be lockers, a rest room, and toilet facilities for the office workers and proofreaders. The rest room would be available to all female employees of the printing plant.

There should be sufficient bookcase space in the office that we could save at least one sample of the outstanding books we manufacture. Also there should be provided space for a suitable case to file samples of other work produced in the shop.

Proof Room.--During peak times we need the services of as many as five readers. Each of these groups should be separated far enough that the voices of one group do not interfere with those of another.

There should also be space in the proof room for a goodly assortment of work produced in the shop.

I estimate that 600 sq. ft. would house the proof room properly.

Composing Room.--At present the composing room is very crowded and poorly ventilated. It occupies portions of three rooms and a portion of the basement corridor (the latter is in violation of State Fire Laws).

While the monotype equipment is definitely a part of the composing room it should be partitioned off with as nearly a sound proof wall as would be practical. Under present conditions this noise causes the other workers to lose their efficiency much sooner than they would if the work room were more quiet.

The monotype equipment we have needs three times the space it now occupies.

We should have one more linotype machine. Also space should be provided for a fourth linotype if and when it is needed.

We should have additional faces of book types. The character of the work and the reputation of the University Press would be enhanced if we had additional type faces.

We should add a line-up table for drawing off book forms to be sure they are in register. (The method we have followed depends too much upon the ability of the individual doing the work.)

We should have a mechanical device for testing the height of printing plates before they go to the press.

Our composing room should be equipped with a proof press of such precise construction that forms up to the Miehle Vertical size could be tested and adjusted for registration before they go to press. (Time and cost tests prove the economy of the plan of having forms in as nearly perfect condition as possible at the time they are put on the printing press. Under present conditions we lose a good many hours of press-running time each year because of lack of space in the composing room to do this preparation before the forms go on the press.)

There should be space enough between the imposing tables that lifting devices could be installed for getting the heavy forms up and down. (Under present conditions there is danger that the men will be injured when lifting type forms.)

In connection with the composing room there should be a storage space for odds and ends which should not be in the work room proper.

Space for standing type should be increased.

There should be separate lockers, wash room and toilet facilities for the workers in this group. At present these people do not have even a decent place to hang their coats.

Press Room.--Our press room should be equipped with one additional automatic cylinder press and enough extra space to later install a fourth cylinder if it is needed.

In connection with the press room there should be a room for storing roller boxes, oil, type cleaners, and other items which should not be in the work room.

The press room should be provided locker, wash room, and toilet facilities.

Offset Press ~~and~~ Equipment.--The Multilith (offset) equipment which was added in 1941 has proven to be of value to the several departments of the University. This little machine has already allowed us to take down at least two tons of standing forms. This subdivision should be given much consideration in any plan for expansion. Probably the next step to take in expanding these facilities would be to install a 17" x 22" press and a camera which would take film that size. Also, there should be space enough that a 21" x 25" press could be installed later. (This latter size would allow us to print in one signature a 16-page 6" x 9" book.)

Bindery.--To properly care for only the binding we are doing at present the space for this department should be expanded four times. An increase to 7000 sq. ft. for this subdivision would not be too great.

To our bindery equipment should be added a book trimming machine to take care of the thousands of books we trim each year. A book trimmer would improve the quality of our work and would save considerable money.

We should add a multiple-station stitcher to save the cost of gathering the saddle stitched books.

We should replace the present paper cutter with one of sufficient capacity to trim the largest sheet which will fit on our presses.

We should have one more small folding machine.

Space should be provided for one more large folder.

Our model B Cleveland folder will not fold to precise register and should be replaced with a folder of the Cleveland MM type.

We should have space enough in our bindery that we could keep our circular rotating gathering table set up at all times. At present we do not get anything like the full advantage of this piece of equipment.

In connection with the bindery there should also be considerable storage space for shipping boxes.

There should be locker, wash room, and toilet facilities for the men. Also, there should be suitable locker and toilet facilities for the women.

Utilities.--All of the manufacturing divisions of a printing plant require electricity, gas and water. A careful study will be required to determine adequacy. Adequate lighting should be installed.

Office Supply.--Whatever move is made toward providing new quarters for the Print Shop should include adequate provision for the Office Supply Store. From the standpoint of employing a competent person to take charge of our paper stock it would be advantageous to continue the present relationship between these departments.

Prepared by: C. E. Herman
Superintendent of Print Shop

REPORT TO BOARD OF TRUSTEES

As a committee of one assigned to make an inspection of the University of Illinois Press, permit me to report:

Soon after starting study of the functions of a University Press, it became apparent it was necessary to approach the subject from two widely divergent viewpoints--(1) From the mechanical and operating angle and (2) from the standpoint of its function in encouraging and preserving scholarly publications written by faculty members.

I was impressed by scope and volume of work handled by the University Press and I believe it worth while to acquaint the Board members with the report recently submitted by Director Cunningham to President Willard covering production from June 1, 1940, to May 31, 1941. It reported 2540 printing job orders, including the Local Directory, 368 pages, 4370 copies; Announcement of Courses, 80 pages, 4140 copies; Board Minutes, 540 pages, 2270 copies; Trustees Biennial Report, 1168 pages, 860 copies; Weekly Calendar, 47 issues, 240 copies; 7 Studies in the Social Sciences 1050 pages, 5770 copies; 86 Agricultural Bulletins and Circulars, 2639 pages, 833,150 copies; 6 Business Research Bulletins, 244 pages, 16,480 copies; 25 Engineering Bulletins and Circulars, 1248 pages, 68,639 copies; 3 High School Visitor Bulletins, 144 pages, 7014 copies; High School Conference Programs, 40 pages, 7106 copies; College of Medicine Catalog, 102 pages, 4100 copies; College of Dentristry Catalog, 68 pages, 5430 copies; College of Pharmacy Catalog, 36 pages, 2080 copies; Comptroller's Report, 60 pages, 1720 copies; Green Caldron, 4 issues, 144 pages, 6890 copies; Student Organization Report, 40 pages, 650 copies; Annual Register, 452 pages, 31,620 copies; Graduate School Bulletin, 3 issues,

152 pages, 8440 copies; 6 Summer Session Bulletins, 128 pages, 27,680 copies; Commencement Programs, 3 issues, 28 pages, 11,980 copies; Freshman Booklet, 44 pages, 10,260 copies; 12 University Extension Bulletins, 200 pages, 56,260 copies; 3 Time Tables, 284 pages, 33,660 copies; Fine Arts Bulletins, 92 pages, 16,480 copies; 2 University High School Bulletins, 64 pages, 3200 copies; 25 Agricultural Economics Circulars, 270 pages, 110,310 copies; College of Law Catalog, 36 pages, 6960 copies; Farm and Home Week Programs, 48 pages, 14,450 copies; 5 Radio Programs, 40 pages, 70,000 copies; 2 Journalism Bulletins, 44 pages, 3319 copies; 8 President's Circulars, 116 pages, 42,520 copies; Honor's Day Program 32 pages, 3080 copies; 10 Registrar's Circulars, 122 pages, 28,900 copies; 10 Student Housing Circulars, 138 pages, 21,140 copies; 4 Physical Education Bulletins, 164 pages, 8630 copies; 4 High School Testing Circulars, 38 pages, 9170 copies; 5 Athletic Association Bulletins, 86 pages, 19,330 copies; and 6 Chicago Department Bulletins, 202 pages, 29,300 copies.

The total receipts of the Print Shop were $128,133.62 which was distributed as follows: charges for paper stock, engravings, and other materials, $51,346.41 and for operating expenses, $76,787.21.

The equipment in the Print Shop is carried on the books at a present worth of $127,027.69.

Managed and operated strictly on a business basis, the Print Plant has cost records on every job and it is apparent that an actual saving of from 25 to 40 per cent over commercial shop prices is effected. An excellent system of filing and records is maintained, facilitating reruns at real savings.

Equipment, though inadequate to meet all the demands, is generally modern and efficient, the notable exception being a power paper cutter of many

years in service. The bindery is severely handicapped by lack of needed equipment.

Additional machinery, however, is out of the question until adequate quarters can be found. How the Print Shop operates efficiently in such cramped space is difficult to understand.

The basement of the Administration Building, used to house the shop, is totally unsuited. Not only is there a decided shortage of necessary working space, but the rooms are dark, poorly ventilated, and ill-suited for efficient production. The glare from the lights in the shop office creates a situation harmful to the eyes as one may attest after only a short experience.

Some new arrangement should be made immediately for a room for the proof readers who at present are cooped up in an air tight glass cage in the middle of the work room. Ventilation is possible only through the opening of an outside window, and in the summer time the heat is so terrific that ice and fans are used to lower the temperature.

Air conditioning throughout the plant would be welcome, but not to be recommended if it is the intention to remove the plant to other quarters, more adapted to the needs.

Quality of work produced is splendid and comparable to that of the artistry of the highest grade commercial plants.

Employees of the University Press are under civil service and enjoy the same status as other University employees.

I am happy to report that production, from the standpoint of quality, volume and cost rates high and reflects creditably upon the director, Mr. Cunningham and the superintendent, Mr. Herman.

Lack of funds and lack of equipment have minimized the usefulness of the University of Illinois Press in the printing of scholarly and learned publications, a function which is generally recognized as a basic responsibility of a university press. Only in a small measure has the University of Illinois Press been able to extend its services to such publications. It had been hoped that sufficient appropriations would be granted by the state legislature this last session to permit an extension of this program, but funds were not forthcoming.

A commercial publisher is distinctly not interested in a book that will not have general appeal, sufficient to meet his expenses and provide a profit. Thus the only possible publishers of scholarly works are the university presses and some universities have made notable contributions along this line.

Illustrative of the point I make is the recent publication by the University of Illinois Press, "GENERIC RELATIONSHIPS OF THE DOLICHOPODIDAE (DIPTERA) BASED ON A STUDY OF THE MOUTHPARTS", by Sister Mary Bertha Cregan, R.S.M. This is a highly technical monograph, but of sufficient value to attract a very favorable review in the "Annals of the Entomological Society of America" September 1941 issue. The last paragraph of this review is of particular interest:

"Besides the excellence of the work itself we are pleased that a mere state university, state controlled, can find funds for publications of this size. All honor to the University of Illinois".

I would recommend that the Director of the University of Illinois Press by authorized to make an extensive program for future development of the Press, both from the standpoint of production and publication of learned

works. I would suggest also that he explore the possibilities of a building suitable for the offices and shop, that he study the question of combining the shop of the Illini Publishing Co. with the Press. Also out of the work of the University Press might evolve a course of printing engineering in connection with the School of Journalism, for many of the journalism students plan to enter the small newspaper field where job printing is an important factor in the business; also that the Director of the Press be authorized the possibilities of enlarging the bindery to take care of the binding for the library.

I hope all the Trustees will avail themselves of the opportunity to inspect the print shop of the University Press and will give heed to the value of the Press as an agency for preserving valuable works in print which otherwise might be lost.

On motion of Mr. Jensen, this report was adopted, and the Director of the University Press was instructed to formulate and present a long-term program for the development of the Press; and the special committee was continued for further study and subsequent report on the progress of the Press. (Dated November 18, 1941)

Prepared by: John R. Fornof

PROJECT GEN. 6

RESIDENCE HALLS FOR UNDERGRADUATES

A study of the housing of our students shows that we have just about reached the saturation point of accommodations, and had reached it in 1939, when we had our peak enrollment. A study of Table I, indicated that if we reach an estimated enrollment of from 14,000 to 16,000 students in the post-war period, we will be short on housing accommodations for from 2,512 to 4,512 students. At the time of our peak enrollment, we had utilized some substandard facilities in order to accommodate the group at that time.

The first conclusion is that we must construct some dormitories if we are to accommodate the group we expect after the war.

A comparison of dormitory facilities for men and women and total student body at the University of Illinois and six other Big Ten universities is made on Tables II and III. These tables indicate that Illinois has the lowest percentage of its women in dormitories in the seven considered, next to lowest percentage of men accommodated, and the lowest percentage on the total of men and women.

The second conclusion which can be drawn is that, if university operated dormitory facilities are desirable, and we assume they are, the University of Illinois is generally behind neighboring institutions in providing this type of housing.

The next question to be answered is how soon such a program should be started, and the only conclusion is that it should be started just as soon as possible after building restrictions are lifted and building can begin. It seems clear that we have reached our limit of housing with present accommodations, and additional people will have to be satisfied that we have accommodations for them before they will be interested in coming to this university.

Table I. Students Housed in Present Community Accommodations at Peak Enrollment in 1939

Accommodations	Men	Women	Total
Student Homes (Rooming Houses)	4,500	1,500	6,000
Fraternities and Sororities	2,000	750	2,750
Dormitories:			
University	450	350	800
Privately owned	525	100	625
Cooperative Houses	250	175	425
Commuting	235	39	274
Living with parents	500	114	614
TOTAL	8,460	3,028	11,488
Married Students living in own homes, apartment dwellers, students working for room			802
TOTAL			12,290
Estimated Post-War Enrollment	10,000 to 11,000	4,000 to 5,000	14,000 to 16,000
Shortage of Housing Facilities	1,540 to 2,540	972 to 1,972	2,512 to 4,512

Therefore, funds should be provided as soon as possible to draw the plans for proposed new dormitory construction which can be started just as soon as building restrictions are lifted.

If this conclusion is logical, then the next matter to consider is what type of dormitory should be built, and what level of standards should be met. It is my opinion that the standard of construction should be of average good quality. It should not trend toward luxurious, nor should it be of sub-standard quality. We could scarcely justify the first, and we should not tolerate the second. It is also my opinion that, in building dormitories, we should not expect to house any particular group of undergraduates in these buildings, for example, I would not favor dormitories for freshmen or for

seniors, or for any particular class; I believe they should be constructed for the housing of a cross section of the student body, maintaining the proportions of seniors, juniors, sophomores, and freshmen in the student body. Educationally this proposal is sound. The one exception which I would favor in this proposal would be a separate housing unit for graduate students but constructed as a unit of small apartments with more expensive accommodations, more private conveniences, etc.

Table II. Residence Halls in Big Ten Schools, 1940-41

Big Ten Schools	Number in Residence Halls	Enrolled	Percent in Residence Halls
Northwestern (Evanston)			
Women	403	2,219	18.1
Men	302	2,921	10.3
Total	705	5,140	13.7
Wisconsin			
Women	768	3,905	19.6
Men	1,182	8,107	14.5
Total	1,950	12,012	16.2
Michigan			
Women	1,023	3,609	28.3
Men	1,527	8,343	18.3
Total	2,550	11,952	21.3
Indiana (Bloomington)			
Women	701	1,805	38.6
Men	385	3,580	10.6
Total	1,086	5,385	20.1
Purdue			
Women	385	1,482	25.7
Men	1,016	5,795	17.5
Total	1,401	7,277	19.2
Minnesota			
Women	976	5,934	16.4
Men	536	10,806	4.9
Total	1,512	16,740	9.0
Iowa (Iowa City)			
Women	666	2,385	28.0
Men	1,487	4,503	33.0
Total	2,153	6,888	31.3
Illinois (Urbana)			
Women	358	3,011	11.8
Men	450	8,067	5.2
Total	808	11,078	7.2

Table III. Summary of Percentages of Students Housed in Dormitories in Big Ten Universities, 1940-41

Big Ten Schools	Enrollment Percentages Women	Men	Total
Indiana	38.6	10.6	20.1
Michigan	28.3	18.3	21.3
Iowa*	28.0	33.0	31.3
Purdue	25.7	17.5	19.2
Ohio State*	20.2	5.2	9.8
Wisconsin	19.6	14.5	16.2
Northwestern	18.1	10.3	13.7
Chicago*.	17.1	14.1	15.2
Minnesota	16.4	4.9	9.0
Illinois	11.8	5.5	7.2

* Data supplied by W. C. Huntington, Chairman of Building Program Com.

The rate of building these new dormitories is much more in the realm of speculation, since no one can predict with accuracy what our future enrollment will be. I think we should be prepared to proceed with new first units for men and women as soon as possible and that the additions to these units should be contemplated as rapidly as the need for them seems to be imminent. Detailed plans for the first units would, therefore, be in order, and tentative plans for additions should be ready.

Prepared by: Fred H. Turner
Dean of Students

PROJECT GEN. 7

FACULTY-GRADUATE STUDENT CENTER

On behalf of the several committees appointed by the President to study the problems relating to a proposed Faculty-Graduate Student Center, I am submitting the following recommendations to the University Building Program Committee. It is to be understood that the several committees were set up very recently. They have had only one meeting. Consequently, their recommendations are, in the nature of the case, very general, and will be subject to revisions and modifications, after the committees will have had time for more detailed study.

Their thinking on the facilities to be provided is based on the following population figures. There are 2,300 members on the staff of the University. There are in normal times about 1,200 graduate students. Of these probably 600 would be included under the staff. In addition, there are from time to time various visiting professors and lecturers, and other guests of the institution. A very general statement of the facilities which we think such a proposed center should provide is given first.

A. For faculty and staff of the University of Illinois.

1. For the staff of the University as a whole.

   a. Food service in the dining rooms to accommodate approximately 300. This includes the numbers to be served in several proposed private dining rooms (see next item).

   b. Rooms for meetings of the departmental groups, committees, conferences, and organizations of faculty and staff, and for meetings sponsored by a member of the faculty or staff, with provision for food services if desired.

   c. A large room for lectures, dances, and other social functions.

2. In addition to the facilities specified above, the following are proposed for members of the University Club:

   a. Rooms and food service for parties for members by special arrangement. These would be provided in the private dining rooms.

b. Facilities for club parties and other entertainment activities of the club. These would be provided in the dining rooms and the large room proposed above.

c. Library room.

d. Recreational facilities -- card room, billiard room, and other facilities that may be feasible.

e. Lounge rooms for men and women with facilities for serving coffee, soft drinks, and perhaps sandwiches, ice cream, etc.

f. Rooms for a limited number of regular staff members of the Club who desire living quarters. (Perhaps as many as 30.)

g. Guest rooms (perhaps 3).

B. For graduate students (to be operated by the University).

1. Dormitory rooms for men and women. (Perhaps as many as 100.)

2. Food service, probably cafeteria, in addition to the regular dining rooms.

3. Appropriate lounge rooms.

4. Facilities for professional and social groups of graduate students.

5. Special facilities for foreign students.

On this last point I quote from the letter written by Dean Gray of the Graduate School: "Likewise, facilities at the University of Illinois for students from other countries are quite inadequate when compared with those available at other great universities. I feel certain that after the war the United States will be a world center to which graduate students from all over the world will come in large numbers. If the University of Illinois is to share in this movement and to attract its fair proportion of such foreign students, we must be prepared to provide better facilities for their use than has heretofore been the case."

A rough preliminary analysis of the proposed service in the light of the populations to be served has resulted in an estimate of a building

providing some 100,000 square feet of floor space, including basement and attic floors. This estimate suggests that the total cost of the project, including expenses involved in obtaining an appropriate site, would be in the neighborhood of $1,000,000.

The Board of Trustees and the University Club have tentatively approved the general idea of a Faculty-Graduate Student Center. The matter has not yet been acted upon by the University of Illinois Women's Club, but expressions by members of this organization indicate that approval is likely. At the recent meeting of the several committees appointed by the President the discussion indicated general approval. Hence, I think you may assume that the proposal of a Faculty-Graduate Student Center is presented to the University Building Program Committee, with the support of the several committees recently appointed by the President.

Prepared by: M. T. McClure
Dean of the College of Liberal Arts & Sciences

PROJECT GENERAL 8

ADDITIONS TO ADMINISTRATION BUILDING

At the time the Administration Building was constructed, additions on both the north and south were contemplated. It is proposed to construct these additions at this time, involving 82,000 square feet of floor space at a cost of $800,000. This estimate is based on construction of two wings 50 feet in width, four stories in heighth, extending the full depth of the present two units. This is needed,

1. To relieve the serious shortage of administrative space on the campus. At the present time, there are few if any administrative units in the building adequately or satisfactorily housed due to present limitations of space.

2. The construction of these wings will provide horizontal connections at each floor level between the present east and west units of the Administration Building, removing a great deal of inconvenience that now exists relative to passage between the offices in the two units. Administration Building East was originally constructed as a classroom building. When Administration Building West was used for administrative offices only, there was little need for communication between the two units. At the present time there is a great deal of traffic between the offices which can only be accomplished between offices in upper floors by descending to the first story or by means of the walks on the exterior between the two units and then ascending to the floor desired. In the case of some offices, many such trips must be made each day.

3. No elevator is provided in Administration East. When that building is used for administrative purposes an elevator is quite essential. If

horizontal connections were possible at each floor level, such as would be provided by the additions, such elevator service could be made available from the present elevator, thus obviating installation of an additional elevator in Administration East which will be necessary in the immediate future if these additions are not provided.

Prepared by: E. L. Stouffer
Architect, Physical Plant Department

PROJECT GENERAL 9

CENTRAL RECEIVING STATION AND WAREHOUSE

The University receives many shipments by railroad freight, motor freight, express, mail and local delivery. There is no central receiving point on the campus to which deliveries can be made or through which they might be cleared and it is necessary for employees of the various carriers and vendors to locate and make deliveries to University departments. These individuals are not always familiar with the campus and the result is that numerous deliveries are made to the wrong point.

The need for a central receiving station has long been recognized but due to the fact that no suitable location has been available such a receiving station has not been established. If suitable housing for a receiving station could be provided, it would make possible proper control of incoming and outgoing shipments. The following are some of the advantages which would result:

1. Deliveries would be made by University trucks or by other means under definite instructions which would insure deliveries to the proper destination. As indicated above, deliveries are now often made to wrong departments, resulting in delays and inconveniences.

2. Reports of receipt of material would be promptly available to the Purchasing Division. At present such reports are not made promptly, resulting in considerable inconvenience and also loss of cash discounts.

3. Facilities would be available for proper unpacking of shipments. Shipments are now delivered to departments, some of which do not have facilities and personnel for unpacking, which results in added expense to departments and, occasionally, damage to materials received.

4. Prompt information concerning damage to materials in transit would be available for filing of claims.

5. Use of campus drives by commercial vehicles would be eliminated.

6. Under present conditions we have practically no control of shipments going out of the University. A central receiving station would provide facilities for the proper handling of these shipments and supply necessary records.

The University also needs a warehouse for the purpose of storing items of surplus equipment. There is much equipment in the various departments which is no longer being used by the departments which should be accumulated in a central warehouse, thus making it available for use by other departments. Such a warehouse could be operated in conjunction with a central receiving station.

Prepared by: H. M. Edwards
Purchasing Agent

PROJECT GEN 10

RADIO STATION W-I-L-L

I. PRESENT ACTIVITIES

According to the statement of general policy approved by the Board of Trustees December 18, 1939, Station W-I-L-L is operated "because the University has important material that it can offer to the people of the State not available through other channels. The function of the station is to distribute such material . . . . . in the interests of higher education and scientific research, to contribute to the better appreciation of the arts and a better understanding of the social, economic and civic problems of the State and Nation, to present the services of educational agencies, to foster and aid public education, to report developments in science, and offer uncolored factual material on questions of general interest."

Like other radio stations, W-I-L-L is a going concern every day from the minute it goes on the air at 7 o'clock in the morning until local sunset as determined by the Federal Communications Commission. The year ending June 30, 1943, W-I-L-L was on the air 4,226 hours, or almost 12 hours each day. This was an increase of 667 hours over 1942. Some 911 persons made 4,579 appearances before W-I-L-L microphones during the year.

In addition to broadcasting 25 courses from the classrooms and many series of educational programs arranged especially for broadcasts during the past year, it continued with such regular features as news, markets, forums, etc. Its musical programs rate among the best in the Nation.

In its regular broadcasting schedule, W-I-L-L presented programs in cooperation with some 20 service and educational organizations and various war agencies.

II. PRESENT SPACE

The space now utilized by W-I-L-L, other than its transmitting facilities south of town, was made available on an emergency basis to relieve conditions which had been totally inadequate for ten years in the original building on Illinois Field. When plans approved by the Board of Trustees in August 1941 to remodel the Lower Gymnasium of the Woman's Building for radio use were dropped because of war conditions, the School of Journalism released sizeable areas in Gregory Hall for our use. We have available in our present location the following area: Studio A, 18 ft. by 22.5 ft; Studio B, 18 ft. by 21 ft.; a library for housing musical records, transcriptions and radio scripts, 18 ft. by 18 ft.; an announcer's room, 16 ft. by 10 ft., an office 16 ft. by 7 ft., another 16 ft. by 11 ft.; a reception area 9 ft. by 32 ft.; a master control room 10 ft. by 12 ft.; a control booth for Studio B, 6 ft. by 12 ft. plus necessary sound lock areas, all on the second floor of the west wing. On the first floor we have the part-time use of the Auditorium of Gregory Hall as an audience studio (Room 112 which we refer to as Studio C); and a news room 18 ft. by 18 ft. in which is housed the Associated Press printer which operates twenty-four hours daily. In the basement we have a room approximately 16 ft. by 7 ft. used by the station's engineers for the repair and maintenance of equipment. The total area available to us approximates 6,500 square feet.

Aside from the use of Studio B four hours weekly by the School of Journalism and the sharing of the audience studio (C) with others, there is a little conflict at the present. Our greatest handicap is that our organ is located in the audience studio. It should be available to us at all times, but is is not because of conflicting assignments to that area for other than

radio use. The principal disturbance to Journalism, I believe, is that in spite of sound treatment, activities in both studios A and B transmit sound to the library below.

In general, handicaps under the present conditions are not so much regarding space, but rather the arrangement of facilities on three floors. All space is highly utilized even though the station staff is not at its authorized strength at the present time.

III. POST-WAR DEVELOPMENT

What the post-war development will bring in radio insofar as it will affect the University's activities we do not know. The radio industry research organizations tell us that Frequency Modulation, Facsimile Broadcasting and Television are out of the experimental stage and that the next decade is likely to see great expansion in all three fields.

Facsimile broadcasting would present no special requirements to us other than the use of an additional room perhaps 12 ft. by 16 ft. in area. At the present it appears that Frequency Modulation broadcasting will develop rapidly after the war. We now have a low power transmitter of this type. Should developments warrant our expanded use of Frequency Modulation, the programs we would transmit would be of a different type than those going out over W-I-L-L. Therefore, two types of production would be on the air at the same time and additional studio facilities would be required. Television is likely to be such an expensive proposition that the University could not justify its use for years to come.

Looking toward the future, it may be pointed out that in Milwaukee one of the major stations has just completed a new million-dollar building looking toward future radio expansion, and W-G-N, Chicago, has announced plans for the construction of a new structure for the same reason.

IV. PROPOSED NEW SPACE

It seems safe to assume that with the return to normal enrollment and the anticipated increase, the School of Journalism will need facilities now being used by W-I-L-L, and that we shall have to find a new location. The Journalism faculty has suggested to Dean Hudelson's committee that perhaps a new building should house the University Press, the Radio Station, the Illini Publishing Company and the School of Journalism. We should be happy to cooperate in such a proposal.

Unless such a building is provided we should like to have considered again the original proposal to house the radio station in the Lower Gymnasium of the Woman's Building. This space, properly rebuilt would not only meet the radio needs for years to come but would offer an opportunity to house in the same area the offices of Public Information.

Approximately 10,000 square feet of space should be made available. Future needs should contemplate the availability of five studios of various sizes, several work rooms, ten offices, a library for housing our fine library of records, an engineer's work room, a news room, a room to house the sound producing unit of a pipe organ, etc. Generally, these were the items originally incorporated in the proposed Woman's Building plan. In general, the future radio quarters should be centrally located, should be on the ground floor in order to utilize floating type of studio construction, should have immediately available a minimum of 50 pairs of University telephone lines, adequate power supply to take care of present and future needs, and, because of the need for complete isolation from sound which prohibits the use of windows and outside ventilation, the area should be air-conditioned.

V. FUTURE DEVELOPMENT

This we are unable to predict. It all depends on the way the science of broadcasting goes as regards Frequency Modulation, Facsimile Broadcasting and Television, as discussed in the "Post-War Development" section.

VI. SUMMARY

1. While station W-I-L-L has been getting along very nicely in its present quarters, the space is on three different floors, there is not sufficient room to house a complete staff, and there are minor conflicts because of the cooperative use of certain of the areas.
2. The space being used is "borrowed" from the School of Journalism, which will probably need all of this space as soon as enrollment returns to normal.
3. Some central location having a floor area of approximately 10,000 feet should be planned to provide five studios, 10 offices and work rooms, etc., and all this area should be air-conditioned.
4. With the facilities described, we believe the normal needs for our radio work can be met under the present type of broadcasting, under the Frequency Modulation type and in the field of Facsimile. We cannot estimate how rapidly Television will develop nor whether the expense of that type of operation will prohibit an education institution from engaging in it. This question probably cannot be answered for ten years.

Prepared by: Joseph F. Wright
Director of Radio Station

VII. SUPPLEMENTARY STATEMENT

The present joint occupation of quarters in Gregory Hall by Radio Station W-I-L-L and by the School of Journalism, together with the possibility of an extended curriculum in radio which is being planned for the post-war period, raises certain housing and building problems involving both the School of Journalism and Radio Station W-I-L-L.

The present quarters now occupied by Station W-I-L-L are insufficient for both the station and the School of Journalism. If Station W-I-L-L is to continue in these quarters, additional space will be necessary both for station purposes and for instructional purposes. If the quarters now occupied by Station W-I-L-L are vacated, this space would be sufficient for instructional purposes with the necessary remodeling. Restoration to the School of Journalism of the space occupied temporarily by Radio Station W-I-L-L would satisfy the immediate post-war need for housing instruction in radio in the School of Journalism.

We look forward to work in television, facsimile newspaper production problems, and experimental work with radio and television press. The School of Journalism in its future plans for radio hopes to be able to continue the present cooperation with Station W-I-L-L. It is possible that your committee, in studying the housing problems of radio instruction and of Station W-I-L-L, may come to the conclusion that certain space might be profitably occupied jointly. The School of Journalism is anxious to cooperate with your committee and with Station W-I-L-L in the study of these problems.

Supplementary State Prepared By: F. S. Siebert
Director of School of Journalism

PROJECT GEN. 11

ADDITION TO McKINLEY HOSPITAL

When capital improvements of the University are under discussion, consideration should be given to the urgent need of an addition to the north end of the McKinley Hospital. Unless it is further enlarged, the University will not be in a position to meet properly the first shock of even a mild epidemic in the student body because we will not have hospital facilities to care for 1½ per cent of its enrollment, to say nothing of provision for members of the faculty and employees and their families. Such a situation has grave possibilities, particularly so when local hospitals will not admit cases of communicable disease.

Certain changes were made in the old wing of the Hospital to provide for an x-ray unit. They reduced the number of beds from 75 to 68. The south wing, erected in 1940, has a capacity of 44 beds; the Hospital a total of 112 beds.

During minor waves of influenza in February 1939, the need for the hospitalization of students exceeded this capacity from February 9 to the 19th, a period of ten days; from February 12 to the 17th, the demand for hospitalization was greater than 165 beds. On February 14, it was necessary to hospitalize 225 students. This was only 1.6 per cent of the students enrolled at Urbana.

During the month of January 1940, there were 110 patients in the Hospital on one day, or just two less than its normal capacity; on the 10th there were 103; on the 17th, 107; and on the 18th, 107. From January 9 to January 19, a period of ten days, the lowest daily number of patients was 90, the highest, 110. Student illness produced a demand for hospitalization so close to the normal capacity of the hospital that the reserve of empty beds

did not exceed the number of patients often admitted in a single day under ordinary circumstances from November to April. Even in the mild wave of influenza in February 1939, 56 students were admitted in one day, which is 12 more than the capacity of the new wing.

The management of a student hospital faces two difficulties:

1. Facilities must be available for students when they are ill, otherwise a catastrophe may result.
2. On the whole, students are a healthy group. Even if only a reasonable minimum of beds is provided to take the first shock of an epidemic, a deficit is almost certain to occur, largely due to the fact that potential protection must be at hand for all students, when only about one in six will be hospitalized during the year from which income may be obtained.

The difficulty is further accentuated by the brief incubation period of common respiratory infections; that of influenza is "short, usually 24 to 72 hours". An epidemic, therefore, may appear almost as "a bolt from the blue" and overwhelm inadequate facilities before proper provision for hospitalization can be made. The confusion and overcrowding incidental to such a situation is quite likely to be associated with cross infections, more serious illness, and an increased mortality rate.

In order to accommodate ill students during both February 1939 and January 1940, it was necessary to remove the equipment from the surgery, the emergency room, the retiring room for parents, and the Dean Clark recreational room to put beds in them. In the latter two instances, this was only a matter of inconvenience and of no great importance. Having to do away with the surgical unit and the emergency room in the presence of a great increase in the admission of patients invites disaster should emergency arise for their use.

It encourages criticism very difficult to meet. In our judgment, dismounting of the surgical unit and the emergency room should not be permitted under any circumstances. The local hospitals will not take cases of communicable disease, and were a student in the McKinley Hospital, or even on the outside, to develop complications due to infection, his chance of recovery might be greatly reduced by his inability to obtain prompt surgical treatment.

We do not believe it is wise to depend upon local hospitals to revoke their rules against infectious disease to admit students for surgery in an emergency caused by complications resulting from contagion. Material help from the local hospitals in the emergency of an epidemic is unlikely. Their rule against taking cases of communicable disease makes it highly improbable they would aid if they could; it is even more unlikely that they could if they would.

Prepared by: J. Howard Beard, M.D.
Head of Department of Health Service

PROJECT GEN. 12

LARGE AUDITORIUM

It is recommended that the Building Program Committee give consideration to a proposal to include a new Auditorium in the University Building Program. The present Auditorium serves some purposes very well but it is often too small to serve us adequately. There are numerous occasions in the course of a year where we have need for an auditorium seating more than the 2,200 who can be accommodated in our present auditorium. It is believed that if we had a building which could accommodate larger groups, that there might be even more occasions when it would be used.

Indiana University has built a new Music Hall seating approximately 4,500. Purdue has a similar building seating 6,500. Michigan State has a new building seating 6,800. All of these, we are told, are serving very useful purposes on their campuses. It would seem to us that such a building for us should seat approximately 7,000.

We have no idea as to the cost of such a building, but believe that the Physical Plant Department could make comparative estimates. Certainly it is true that we are constantly having meetings, lectures, convocations, concerts and public gatherings where our seating needs are far in excess of our present Auditorium and badly housed when these events are moved to a make-shift setup in the George Huff Gymnasium.

Prepared by: Fred H. Turner
Dean of Students

PROJECT GEN. 13

EXTENSION DIVISION HEADQUARTERS AND CONTINUATION STUDY CENTER

The opportunity to forecast the post-war building needs of the Division of University Extension is appreciated. This can be done only in rather general terms, since there are so many questions concerning the future programs of the Division that are dependent upon decisions yet to be made. For example, there is before the Congress of the United States a bill (SB1670) which would provide federal subsidies to general university extension comparable to those already provided, by previous acts of the Congress, to the Agricultural Extension Service. The appropriation is to be distributed to the states in proportion that the population of the state bears to the population of the United States. The bill provides for extension programs in the land grant colleges and state universities only. If enacted into law, the bill would bring to the Division of University Extension of the University of Illinois federal monies to the amount of $1,180,000 annually. This sum would have to be matched by legislative appropriation, University appropriation, or fee receipts to the amount of an additional 25 per cent.

It is obvious that if this bill were to pass, the Division of University Extension would be required to enlarge its organization greatly; and consequently, its requirements for space would be very greatly increased. Under the terms of this bill, we would be authorized to conduct programs in worker's education, the training of government employees, and all other types of extension education to meet the educational needs of persons above school age except that we would be prevented from duplicating any of the work done in the Agricultural Extension Service. Although the bill is not passed and there is no assurance that it will pass, it is believed to be the part of

wisdom to prepare for such an eventuality by making appropriate plans. If federal funds are not available, there is some likelihood that new money for extension work will be made available from state sources. The extent to which your committee would like to inquire into plans for an enlarged program is not known, but we would be happy to give any information that you may seek on the program, provided we are able to do so.

The principal item in such a program that would affect building needs relates to the establishment of a continuation study. This center would provide for the lodging, feeding, and study needs of groups that would be brought to the campus for short courses, institutes, and refresher courses. It is our opinion that the Extension Division could use such a building in such manner that it would be in almost continuous use. It is likely that such a building would have an income that would take care of a considerable part of its cost of operation. However, if such a building were to be constructed, we would like to ask that a study be made of the possibility of providing for the building needs of the rest of the Division of University Extension under one roof. The Division has never enjoyed being housed in a single building in the ten years of its existence.

The University of Minnesota was the first institution to establish a continuation study center. Information as to the success of its operation is available. The University of Michigan has accommodations that result from their large Union Building plus the Horace B. Rackam Building for Graduate Studies, which provide them with facilities very much comparable to Minnesota's. There are a number of other universities whose extension divisions are contemplating the building of such continuation study centers.

We would be glad to submit statistics concerning the Division of University Extension and a history of its past activities, if you believe this would be of assistance to you. The only special room to which attention ought to be given in the architectural studies would be a room with reasonably constant temperature and constant humidity for the storage of our library of motion picture films. This library has a present inventory value of about $75,000, is the fourth largest library of educational motion pictures in the United States, and is the first or second in the rate of growth. Its present quarters are most unsatisfactory, among other reasons because of the fire hazard.

Prepared by: Robert B. Browne
Director of University Extension

PROJECT GEN. 14

ALL-SPORTS BUILDING

The Committee on Future Development of Facilities for Physical Education and Athletics of the Board of Directors of the Athletic Association is pleased to be permitted to submit for consideration of the Building Program Committee the projects which in their opinion are worthy of serious consideration in the post-war planning. The committee feels that its responsibility is to keep before the proper University officials their thoughts as to the needs of the Athletic Association with reference to the use of land, buildings, and other facilities necessary for the proper conduct of inter-collegiate, intramural, and recreational sports. It is their opinion that at the present time facilities for these activities are inadequate as will be set forth later.

For the past several years the Athletic Association has been able to balance expenditures with income, but has not been in a position to accumulate reserves of sufficient size to permit construction of the type possible when the tennis courts and the Skating Rink were erected. Because of this fact, any building program that is desirable for the sports activities of the University, must of consequence, be financed by an appropriation to the University, and should in our opinion be treated in the same manner as any other item in the general University building program.

The trend evidenced before the outbreak of the present war in the field of intramural activities is one that must be recognized for post-war planning. Out of the then 9,000 male students, approximately 3,500 were participating on one or more of the organized intramural teams, besides the large numbers that were playing golf, tennis, and softball as unorganized sports. All of these students make use of the athletic facilities provided.

Because of inadequacies in present facilities, it is the opinion of this committee that the most urgently needed structure for the activities indicated above is a new All-Sports Building, commonly but inexactly referred to as a Field House. Preliminary and tentative building studies of this type of structure were completed by the Physical Plant Department on April 22, 1941. These early studies provided seating facilities for 14,000 to 16,000 persons with a cantilever type roof, completely eliminating undesirable exposed supports. The plans as sketched at that time are in general acceptable to this committee, with the feeling that provision should be made for seating a minimum of 15,000 with a maximum of 20,000. The building should provide needed space for all intramural sports in the form of office space, game rooms, locker rooms, etc. Plans in connection with this building should also provide for an improvement of our swimming pool facilities. Our present pool does not comply with the requirements of the State Health Department on about six counts, and has no provision for high diving. Particular emphasis should be placed on the arrangement of the pool with respect to dressing rooms and lockers from the standpoint of sanitation and convenience.

The construction of such a unit would permit the consolidation of most of the activities of the Athletic Association under one roof, including the coaching and administrative staff, the intramural department, the ticket office, and the store rooms, thereby contributing to closer contact and, consequently, better operating conditions. The association has been repeatedly advised by the auditors that better physical arrangements are necessary for the proper distribution and control of tickets and athletic activity coupon books. Such changes are not physically possible at the present time in existing University buildings. It is true that plans were made for the ticket

office in the new Illini Union Building, but changes in the use of the building and trends there have made such usage impracticable.

Emphasis should also be placed on the construction of well-lighted and well-ventilated courts for handball, badminton, and squash. While it is true that some courts are available in the Huff Gymnasium, all efforts at correctly ventilating them have been unsuccessful, and their efficient utilization reduced accordingly and demands triple the facilities available.

The use of this building would not be confined to Athletics and sports entirely. The need for a center to be used for large convocations has long been felt. At the level of enrollment prior to the outbreak of the war, it was impossible to issue more than three tickets to candidates for graduation. Such large functions as Farm and Home Week, the Farm Sports Festival, the All-State Chorus and All-State Orchestra performance held in conjunction with the annual Teachers Conference, certain numbers on the Star Course Program, the High School Basketball Tournament, and a general convocation of all University students are not possible in their entirety at the present time because of limited seating capacity.

One of the greatest needs for such a building is that of the Illinois State High School Basketball Tournament which has been held annually in Huff Gymnasium during the month of March. It has been the experience of the Ticket Office of the Athletic Association that the seats for this one function alone, which is a source of good public contacts, could have been sold in numbers three or four times that now possible. It has been the policy in the past few years to discourage the general public, even to the extent of giving preference to students in the competing schools and the coaches and principals throughout the State. Indiana has conducted such a tournament annually in the Butler

Field House in Indianapolis for the past several years, with an attendance of twenty thousand, and with this capacity has been unable to meet the demand of the general public. Because many of these who attend are potential students for the University, and because we are concerned with developing and maintaining a strong program of health education, physical education and athletics in the High Schools of the state, we feel that it is desirable to satisfy the demands of as large a number as possible and to retain this annual sports event at the University.

Under present conditions, it is not possible to follow the plan that many of the other Western Conference Schools follow, in issuing an Activity book to each student. With the present seating capacity of Huff Gymnasium, it is impossible to provide seats for the student body, the staff of the University or the general public, for our home Basketball games. Such conditions are not comparable to other institutions of the enrollment or standing of the University of Illinois.

The Board of Directors of the Athletic Association expects to continue the policy of turning surplus funds back into facilities for the students, whenever circumstances permit a return to normal operation.

Prepared by: Committee on Future Development of Facilities for Physical Education and Athletics of the Board of Directors of the Athletic Association

PROJECT GEN. 15

ADDITION TO POWER PLANT

The capacity of present equipment in Abbott Power Plant is inadequate to meet present demands for heat, light and power. This situation is discussed under Projects P.P. 2a and P.P. 2b, where additional equipment is recommended for installation in the present building.

Any extensive building program would require more equipment than can be placed in the present building so it would be necessary to provide an addition if such a program develops.

Consulting engineers have been employed to make a study of the Power Plant and make recommendations concerning additional building space and equipment which may be necessary.

Prepared by: W. C. Huntington
Chairman, University Building Program Committee

SECTION 10

PROJECTS PROPOSED BY

THE PHYSICAL PLANT DEPARTMENT

SECTION 10

PROJECTS PROPOSED BY

THE PHYSICAL PLANT DEPARTMENT

GENERAL COMMENTS

Requests for new buildings and major remodeling projects of the Physical Plant Department are included in Project P.P. 1. Requests for additions to the power plants, water stations, and distribution systems are made under Projects P.P. 2 a, b, c, etc. These improvements are essential if the University is to maintain a safe and adequate capacity for the production of utilities consumed. The necessity of the other buildings-and-grounds improvements, as listed under P.P. 2 in the preceding Summary, except for the street, sidewalk, and general campus improvements, is obvious. The latter items are improvements needed to replace temporary roads demanding high maintenance expenditures and to provide for future building expansion contemplated.

The program of building modernization, as listed under P.P. 3 in the preceding Summary, is an attempt to meet a major problem which the University is facing in the future in preserving the state's investment of $23,958,535 in the buildings on the campus of the University of Illinois at Urbana and Chicago. The life expectancy of the component parts of buildings, such as floors, plumbing, heating, lighting, water systems, elevators, is such that a replacement of these parts over a period of twenty-five to fifty years must be provided if an acceptable standard of maintenance and usage is to be obtained. Maintenance expense on other parts of the building, is such that a similar allowance must be made to preserve the original condition of the structures. In order to maintain the state's investment in buildings at the University of Illinois, an average annual expenditure of a minimum of 2 per cent of the replacement

cost should, therefore, be made. With an investment of state funds in buildings of $23,958,535, the average annual expenditure for building repairs and replacements should be approximately $479,170. However, during the past ten years, the average annual expenditures were only $234,380, or .98 per cent of the total investment instead of 2 per cent. The problem now of preserving the state's investment is even more difficult if the age of the various buildings is considered.

The oldest major building is Harker Hall, which was built in 1878. Eight other buildings were constructed in the nineties. In connection with these major buildings, substantial additions have been made to many of them from time to time, bringing the total number of major buildings and additions to 108. The tabulation below gives the approximate age of the original buildings and additions.

Years	No. of Major Buildings and Additions	Approximate Age (Years)
1878-1898	9	45 to 65
1900-1909	14	34 to 44
1910-1919	23	24 to 34
1920-1929	45	12 to 24
1930-1939	15	4 to 14
1940-1942	2	3
	Total 108	

There are nine buildings, therefore, which, if the University contemplates continuing to use, should have been completely modernized thru a replacement program. Unfortunately, no such program was undertaken and, therefore, the state faces the responsibility of either tearing down such buildings and thereby losing the residual value in them or making relatively large current expenditures to catch up on the deferred replacement program.

Another factor which materially affects such a problem, even if a program of replacement had been established, is the interruption resulting from depressions, wars, etc. This could be prevented in part if the state were in a position to establish reserves for such purposes. Unable, however, to operate on a reserve basis, the only alternative is to make relatively large annual expenditures when funds can be made available, thereby offsetting somewhat the effects of depressions and wars.

In addition to preserving the state's investment, such a program will have real and practical values, such as:

1. Healthful working conditions for all employees are assured.
2. Working in well lighted, clean, and pleasant surroundings improves the morale of the staff and, in turn, pays dividends in improved employee-employer relationships, as well as greater productivity.
3. The public generally judges the standard of the administration and efficiency of the institution by its visual impression of the way the institutional property is maintained and operated. The public loses confidence in an institution which does not adequately preserve the investment entrusted to it.
4. The working efficiency of the academic departments is lowered by obsolete physical facilities with which to work.
5. Operating economies may be realized thru the elimination of obsolete facilities, such as heating systems, etc.
6. Failure to maintain buildings adequately results in requests for new buildings from the academic departments which, in the long-term point of view, will be more expensive to the state than a sound replacement program.

The estimated cost of the modernization projects now needed is approximately $2,000,000 (for Urbana and Chicago). This is slightly less than that which would have been spent if a program had been established ten years ago allowing 2 per cent per year for repairs and replacements.

It is recommended, therefore, that a policy be adopted immediately of allocating annually not less than 2 per cent of the inventory value of the buildings for repairs and replacements (i.e., modernization). This will make it possible to complete the work program now outlined in less than ten years. If possible, the allowance should be greater than 2 per cent to offset reduced expenditures in depression and war periods.

It is also recommended that, as a policy, the University should not request the construction of additional buildings unless funds can be made available for maintaining existing buildings at a satisfactory standard.

Prepared by Physical Plant Department

SUMMARY OF PROJECTS

PROPOSED BY

PHYSICAL PLANT DEPARTMENT

Number

P.P. 1 New Buildings and Major Remodeling of Existing Buildings for use by the Physical Plant Department:

a.	Construction of a new Physical Plant Service Building (Urbana)	$650,000
b.	Expand garage facilities to permit centralized operation of all trucks and cars (Urbana)*.	200,000
c.	Remodeling existing Service Building for use as a warehouse (Urbana)*.	150,000
d.	Construction of a new Laundry Building (Chicago)*.	125,000
e.	Construction of new Physical Plant Service Building (Chicago)*	200,000
f.	Construction of Volatile Storage Plant (Urbana)*	75,000
g.	Completion of construction in the Fire Station Building (Urbana)*	25,000
		$1,425,000

P.P. 2 Buildings and Grounds Improvements:

To meet increased demands for utilities
To meet requirements of the National Board of Fire Underwriters and Western Fire Insurance Association
To meet recommendations of the State Department of Public Health
To meet specific code and safety requirements
Street and road improvements
Sidewalk improvements
General campus improvements

Total (Urbana and Chicago) $3,400,000

* Not included in Inventory

SUMMARY OF PROJECTS - continued

P.P. 3 Modernization of Existing Buildings:

Replacing obsolete one-pipe heating system
Completing ventilating system omitted in original construction
Replacing obsolete ventilating system
Modernizing toilet rooms
Providing domestic hot water service
Replacing elevators
Remodeling exterior of Stock Pavilion
Replacing obsolete thermostatic control equipment
Rewiring buildings to increase level of illumination to modern standards
Installing evaporative condensers
Installing vacuum breakers
Installing dry vacuum systems
Installing building heat controls
Installing soap dispensers
Remodeling to provide adequate space for paper balers, janitor rooms, and equipment and supply storage
Replacing floors, painting and plastering
Acoustical treatment

Total (Urbana and Chicago). $2,050,900

PROJECT P.P. 1a

PHYSICAL PLANT SERVICE BUILDING

I. INTRODUCTION

It is proposed that a new building be provided for the Plant Operation and Maintenance Division of the Physical Plant Department to provide adequate facilities to conduct the business necessary in the fulfillment of the responsibilities assigned to this division. The construction of complete new facilities is necessary because it is uneconomical and physically impossible to expand the present facilities sufficiently to provide necessary space. The present inefficient and disorganized conditions caused by the widely scattered, hazardous and unsightly facilities cannot be eliminated except by construction of a new building, planned to meet the needs of the division. Construction of a new building will also permit the removal of this division from the academic area, releasing space for other usage and also permit the elimination of a number of unsightly obsolescent frame structures.

II. RESPONSIBILITIES ASSIGNED TO THE DIVISION

The Plant Operation and Maintenance Division is organized for the purpose of facilitating and centralizing the transaction, scheduling and recording of all maintenance work and plant operation, and to assist the various University Departments in their functions of teaching and research in every possible way.

The following responsibilities have been assigned to this division, as set forth in Section 51 of the University of Illinois Statutes, March 10, 1936:

1. Building Maintenance.
2. Grounds Maintenance.
3. Operation and maintenance of general University trucks and cars.

4. Operation and maintenance of Power Plant and distribution system.

5. Operation and maintenance of water station and distribution system.

6. Janitor Service.

7. Fire Protection.

8. Police and Watchmen.

9. General superintendence of Public Functions.

10. Physical Plant Storeroom.

11. Physical Plant Cost Accounting.

12. General University Telephone System.

As evidence of the volume of administrative routine necessary, number of individuals employed, cost of completed work, etc., in the execution of these responsibilities, the attached Schedule No. 1 is submitted.

The nature and volume of the work handled by this division is determined by the needs of the University and these needs, in turn, are determined by such variable factors as the size of the University, the number, size and type of buildings. It is obvious that the work and demands for service on this division have increased in the past materially and will continue to increase in the future in proportion to the future growth of the University. New equipment incorporated in all present-day buildings adds materially to the demands on this division because of the specialized personnel and equipment necessary for the operation of these specialties which includes air conditioning, refrigeration, food service equipment, high pressure steam services and equipment, temperature controls, emergency lighting, automatic elevators and dumb waiters, sound projection equipment and public address systems, involving the use of electronics in practically all types of modern, electrically controlled and operated equipment.

III. FACILITIES ASSIGNED TO THE DIVISION

The facilities assigned to the Plant Operation and Maintenance Division are loacted in fourteen different buildings and scattered widely throughout the campus.

The title assigned to the old power plant, "Physical Plant Service Building," applies in name only. It houses the administrative offices, routing, accounting, drafting, and engineering; the telephone exchange and electric distribution shop; and a power plant substation in the old Engine Room. Janitors, police, and watchmen report in and out at the Service Building. However, space is not provided for their headquarters. The old boiler room of the original power plant is used only for storage.

On the north campus, the mill equipment, carpenter headquarters, finish lumber storage, and paint finish shop are housed in a portion of the Wood Shop and Foundry.

The electrician shop is in the basement of the Transportation Building.

The paint shop, paint storage, furniture repair shop, locksmith, awning, shade, and blind shop are all housed in a frame residence at 104 South Goodwin Street.

The North Garage houses the majority of the Physical Plant truck and car fleet, automotive repair shop, machine shop, small tool storage, sheet metal shop, and a portion of the Physical Plant Storeroom.

The Warehouse Annex, adjacent to the North Garage, houses rough or common lumber storage, Plumber and Steamfitter shop, Grounds shop, and the overflow of material and supplies from the Storeroom and Toolroom. Also adjacent to the North Garage are the Furniture Warehouse, Concrete Mixing Plant, bulk gasoline storage, and two small frame garages which are used to store the overflow of equipment.

The steam distribution personnel is located in a shop in the basement of Engineering Hall.

The First Station staff and equipment are located in the old Pump Station and in a small two-car brick garage adjacent.

The water station operators, as well as the office of the Sanitary Engineer, are located in the Filtration Plant.

On the south campus, the South Garage, an addition to the Agriculture Engineering Building, houses a portion of the truck and car fleet of the Agriculture Department and Extension Service, and a small shop space used to service the equipment.

Adjacent to the South Garage in the Old Agronomy Building, additional car storage is provided; also testing equipment for truck and car safety inspection, a glass storage room, and storage space for salvaged material and equipment.

The power plant staff reports directly to the Abbott Power Plant at the west end of Gregory Drive on the Illinois Central siding.

The following is an analysis of the space inadequacies and hazards of the facilities assigned to the Plant Operation and Maintenance Division.

1. Carpenter Shop (500 ft. from office).--Dimension lumber is stored in the Warehouse Annex approximately 1600 feet from the shop. (See attached photographs.)

The Carpenter Shop occupies a major portion of the basement and the first and second floors of the center section of the wood shop.

Because of its nature and arrangement, this building is not suitable for this type of occupancy. Fire hazards which normally exist in a shop of this kind are very materially increased by an obsolete and inadequate dust collecting system, and by an open painting and wood finishing

space, and, because of the lack of fire stops, the combustible nature of the building, trap doors for the passage of materials, and an open wooden stairway, fire would probably spread very rapidly and occupants would probably be trapped, especially those on the second floor.

Many physical hazards exist. Materials and finished products must be carried in and out of the building directly past the feed end of a rip saw and planer. Exterior access is by a single door and exterior concrete steps which become icy and dangerious in cold weather and which prevent close approach of transporting equipment. Materials and products must either be carried from floor to floor or must be passed thru trap doors. The machine room is crowded and does not provide space for handling or placing of materials. The only space except under foot at the machines is the corridor and aisle space between the machines. Stumbling hazards are thus created, not only to workmen but to pupils and academic staff who use these spaces for passage to and from classrooms and locker rooms.

The crowding of the machines limits the number of machines and the quantity of materials which can be worked at one time without endangering other machines and workmen. The length of material which can be worked is limited and material in process must often be passed over or around machines which cannot always be economically stopped while such handling is in process. In order to get long lengths of material thru the sticker, it has been necessary to cut a hole thru the wall into an adjoining room.

The arrangement prevents control of material and equipment. The basement where materials are stored is open to the foundry occupants who use part of the basement for storage, and is also open to the general public. The first floor corridor is used for workmen's lockers, office space, and for storage of tool boxes. As this is open to students and outsiders, this is

conducive to "lost" records, tools, and small equipment. This corridor and the stairs form the only space available for eating purposes, and everyone using this corridor is endangered because of the handling of material and products thru trap doors located in the center of the area.

The basement area used for storage of finished lumber, altho adequate, is very wasteful and uneconomical because of the nature, shape, and arrangement of the space. It is not accessible to direct car or truck unloading. No sorting or unloading space is available where material can be unloaded for future sorting and piling. All materials must be sorted outside and passed thru windows at the rear of the lumber piles or must be carried into the machine room and handed down into the storage area thru a trap door.

The trap door is near one end of the storage area, resulting in long distances of travel and much uneconomical rehandling of material. Low ceilings and large piers prevent logical arrangement and piling of lumber.

Finishing of products in an economical and first-class manner is prevented by the open paint and finishing space, subjecting all finished work to damaging dust and to temperature and humidity changes of the entire building.

Space Analysis

	Present	Required
Finished Lumber Storage	8,600 sq.ft.	9,000 sq.ft.
Office, Machine Tools, Tools and checking space	750	500
Locker and personal tools	none	600
Toilet and washroom	100	120
Machine room	1,700	4,000
Finished products storing and receiving	none	600
Sanding, assembling, gluing, etc.	2,250	2,500
Painting, finishing, drying	600	1,400
Personal conveniences	none	300
Rough and dimension lumber	3,200	4,000
	17,200 sq.ft.	23,020 sq.ft.

2. Electric Shop (450 feet from office).--The Electric Shop is located in the basement of the Transportation Building. Access to the shop is by a driveway from Goodwin Avenue one block east and by one stairway from the southeast entrance of the building.

The occupancy of this space, entirely located below grade, with only one window directly to the exterior and without a ventilating system, is unhealthy and violates all codes for human occupancy. Approximately 34 men use this area, reporting in and out, obtaining equipment, etc.

The use of this space is uneconomical and hazardous because of the excessive costs and hazards involved in the hand handling of large quantities of equipment and materials up and down stairs. A large percentage of available space is usable only for storage because of large ducts with a clearance of only 5 feet.

The telephone exchange is located in the old Engine Room at the Service Building with small shop and storage located in a basement room below.

Space Analysis

	Present	Needed
Electric Shop	6,300 sq. ft.	5,000 sq. ft.
Toilet facilities	None	120
Locker and personal tools	None	300
	6,300 sq. ft.	5,420 sq. ft.
Telephone exchange which may be in same area as offices or other non-dustry, safe occupations	550 sq. ft.	800 sq. ft.

3. Plumbing Shop.--The Warehouse Annex Shop (1,100 ft. from office) and the Chemistry Basement Shop (1,600 ft. from office) are used for this purpose. The spaces used for plumbing shops are entirely inadequate and do not provide any conveniences for workmen, lack storage space for any materials,

tools, or equipment. No separate space is provided for repair and adjustment of thermostatic controls, refrigeration equipment, or for the safe storage of parts under repair. In order to thread both ends of a length of pipe, it must be carried outdoors to change ends.

Space Analysis

	Present	Required
Plumbing Shop	800 sq. ft.	1,200 sq. ft.
Toilet facilities	None	100
Lockers and personal tools	None	200
	800 sq. ft.	1,500 sq. ft.

4. Paint Shop. The main shop is 700 ft. from the office. Ladders and tackle are at the Warehouse Annex (400 ft. from shop), and the glass storage in the Old Agronomy Building is 4,000 ft. from shop and office. The main shop occupies a part of a wood frame residence which is also used for key shop, and furniture, blind and shade repairs.

The use of a non-fireproof structure for the storage of materials as inflammable as paint is extremely hazardous, and a fire would probably trap any occupants of the building, and a flash fire and fumes could be fatal to all occupants.

The building does not provide any space for the storage of containers, and as a result, a very unsightly condition exists in the area around this building.

Paint, oil, volatiles, and containers should be stored in separate storage.

Space Analysis

	Present	Required
Paint Shop	400 sq. ft.	600 sq. ft.
Glass storage and glazing	600	600
Lockers and toilets	None	400
	1,000 sq. ft.	1,600 sq. ft.
Separate Storage		
Paints and oils	1,800 sq. ft.	3,000 sq. ft.
Dispensing and supplies in process	None	1,000
Ladders and tackle (Included with tool room)		
Empty containers	Yard	Yard

5. Key Shop.--This is located in the same building as the Paint Shop and is exposed to all the hazards of the paint shop.

A fire would, in addition to the hazards to personnel, mean the loss of all original keys and hardware under repair.

Space Analysis

	Present	Required
Key shop	450 sq. ft.	500 sq. ft.

Part of this space should be a vault or other protected storage.

6. Furniture Repair Shop.--This would include the repairing of shades, awnings and blinds. This shop is located in the same building as the paint shop and is exposed to all the hazards of the paint shop, plus the added hazards of the highly inflammable upholstering materials and the combustible nature of furniture. The space is poorly arranged, does not provide any space for refinishing or for the storage of work in progress.

Space Analysis

	Present	Required
Furniture Repair Shop	800 sq. ft.	1,200 sq. ft.

7. Sheet Metal and Roofing Shop.--This is 1,100 feet from the office. The present space is very inadequate. Construction, fabrication and assembling of any except the smallest units must be performed outdoors or in areas used by other divisions, causing interference and hazards to others.

Space must also be provided for additional equipment, as the present equipment is obsolete, inadequate, and not suitable for many operations and fabrication, especially in ventilating duct work, in which field a continuous increase can be anticipated. Because of the age of the University buildings, the facilities of this department must be improved to permit adequate roof and gutter maintenance.

Space Analysis

	Present	Required
Tin Shop	900 sq. ft.	3,000 sq. ft.
Lockers and toilets	None	200
	900 sq. ft.	3,200 sq. ft.

8. Construction Laborers, Cement Finishers, and Brick Masons.--At the present time no facilities are provided for shop space or headquarters for the construction laborers, cement finishers, and brick masons. Those crafts report for work in a small corridor at the North Garage which adds to the congestion and confusion at the service windows to the Tool Room and Storeroom, thereby causing delays and errors in the issuance of tools and supplies.

Space Analysis

	Present	Required
Construction laborers Cement finishers Brick masons	None	800 sq. ft.

9. Machinists. This space for machinists is in the present North Garage and is 1100 feet from the office.

The present space is very inadequate. Machines are crowded so that the use of nearly any machine is hazardous to the use of an adjacent machine. Very few machines permit the use of full length stock without overlapping other machines, a highly dangerous practice because of line shaft drives and moving machinery, which is also a hazard to handling of materials.

Trucks must back into the shop for use of lifting tackle. The floor is at ground level, causing much hazardous lifting and handling, crane facilities are inadequate, and this loading and unloading area is the only space available for placing of materials or products and must also be used for assembling purposes. It is also in direct line of traffic from garage space to the storeroom, and must be transversed in using the exits to this area.

The electric and gas welding and the forge are all located in an open area, preventing the safe use of more than one process at any time, causing interferences and delays, and exposing all occupants to the hazards of welding processes.

Space Analysis

	Present	Required
Machine Shop	3,000 sq. ft.	5,000 sq. ft.

10. Grounds Division.--This consists of the North Office and storage, which is 1200 feet from the office, the South Storage area which is 6000 feet from the office, and the Health Service storage which is 1200 feet from the office. The facilities are widely scattered, inadequate, and consist of three wood frame sheds near the Warehouse Annex, a small area for office

and small tools in the Warehouse Annex, which must also be used for drying clothing and eating lunch, three frame sheds and a lean-to south of Pennsylvania Avenue, and the basement of the Health Service Building.

The sheds near the Warehouse Annex are in a fair state of repair, but those at the south campus are poorly constructed, and one shed is open at both ends and offers very little protection. The Health Service basement is not readily accessible and requires carrying of equipment up and down stairs and its use is, therefore, practically limited to out-of-season storage of small equipment. No protection is provided for motorized equipment, which should be stored in a heated space.

No personal conveniences are provided except locker space for regular employees. These are very inadequate and unsuitable for the storage and drying of clothing which often becomes wet and badly soiled in this type of work.

The scattered location also prevents ready access to other shops which are responsible for mechanical services required by the equipment of this division.

Space Analysis

	Present	Required
Office and small tools	600 sq. ft.	600 sq. ft.
Lockers and personal tools	None	800
Storage (present in 3 locations)	5,400	10,000 (½ heated)
	6,000 sq. ft.	11,400 sq. ft.

Yard space and shed protection will be required for graders and heavy equipment now stored outdoors.

11. Garages.—These consist of the North Garage, which is 1100 ft. from the office, and the South Garage, which is 4000 ft. from the office.

A separate analysis is being prepared for the construction of a central garage.

The facilities planned under the Physical Plant Service Building program should include office space and clerical space for the garage operation. The provision of a new Service Building should release sufficient space to furnish temporary relief for the garages.

12. Steam Distribution Shop.--This is exclusive of the Power Plant. This is 800 feet from the office.

The space occupied by this shop is in the north basement of Engineering Hall, a non-fireproof building primarily used for academic purposes. It is unsuitable for any usage except service tunnel for pipes and other building services.

Access is by fire lane and a driveway extending in front of the Fire Station and over a blind walk from the Illumination Laboratory. Entrance is down a short flight of steps under the Engineering Library exit. Heavy valves, piping, water tanks, meters and traps must be carried in and out of the shop when repairs and adjustments are necessary.

The entire area has a dirt floor and a celing height of less than 6½ feet with 5 ft. clearance under beams. The entrance door has a clear height of 5 ft. 3 in. and width of 2 ft. 11 in.

No conveniences for workmen are provided, lighting is very inadequate, and because of the low ceiling is very detrimental to eyesight. No ventilation is provided, and the space is unhealthy and violates all codes for human occupancy.

Another factor is the increased fire hazard endangering the Engineering Library directly over this area with only a wood floor between.

Space Analysis

	Present	Required
Shop and Storage	3,400 sq. ft.	3,600 sq. ft.
Locker and toilets	None	400
	3,400 sq. ft.	4,000 sq. ft.

13. Water Station.--This is 400 feet from the office. The Filtration Plant is the only building in the Physical Plant north campus group which was designed and constructed for its present usage.

Space will be required for the Sanitary Engineer in charge of the plant and for the clerical work in connection with the operation of this division.

The requirements of the Water Station will be submitted as a separate project.

14. Fire Station.-- The Fire Station staff and equipment are located in the old Pump Station and in a small two-car brick garage adjacent thereto. The requirements of the Fire Station will be submitted as a separate project.

15. Administrative Offices.--These offices, located in the Old Power Plant, are entirely inadequate, poorly arranged, and are crowded into an area approximately one-third of that which is necessary.

The only access to the offices for the general public, office staff, and employees who must consult with their supervisors frequently during the day is by means of a single width winding stairs with limited head-room, which is located approximately 60 ft. from the entrance to the building.

The size and shape of the building does not permit separation of functional work and prevents orderly expansion or rearrangement of space that would eliminate the present congestion, confusion, and interferring cross-traffic.

Many necessary items of work, such as maintenance of records and adequate files, development of operation and maintenance programs, etc., cannot be conducted because of the lack of space and facilities to accommodate sufficient staff.

Due to the lack of existing space, many different and varied functional activities are conducted in the same room, resulting in lack of privacy, interferences, interruptions, disturbing machine noises and conversations that prevent efficient and prompt execution of work assignments. It is necessary for the present staff to go to some unused room or space in adjoining buildings or to take their work home with them when the project at hand requires concentration of thought.

For example, fourteen individuals are now crowded into one poorly heated and lighted room without mechanical ventilation, and the congestion and limited space is such that one individual cannot leave his desk without disturbing those adjacent. The staff and functional activities in this room consist of the following: Superintendent of Building Maintenance and Job Order Work, Superintendent of Grounds and Trucks and Cars, Structural Engineer and administrative assistant to the Superintendent of Buildings and Grounds, Electrical Engineer, Civil Engineer, Two estimators, Mechanical draftsman and shop detailer, Landscape draftsman, Principal Storekeeper, Stores Clerk, Stenographer, Typist, and File Clerk.

It is necessary for those individuals in responsible charge of work to have frequent consultations with the various foremen, staff, and

the general public, and when such is necessary, the callers must remain standing or must be taken to some other location for the interview, as there is not sufficient space for additional furniture. This adds to the general confusion and reduces the general efficiency of the entire staff.

Space Analysis

	Present	Required
Offices	3,300 sq. ft.	12,000 sq. ft.

16. Warehouse and Stores.—This is 1200 feet from the office. The warehouse is at present located in an addition to the garage constructed in 1936 and in a portion of the old Warehouse Annex, a frame structure.

The space used by this division consists of a roofed-over enclosed area. The shape was principally determined by the adjacent structure, the wall of which was used to permit construction of the maximum space with the funds available. Because of its shape, type of building and general nature, it is very uneconomical, unsuitable, and hazardous and the space available is inadequate.

The racks for heavy storage, because of lack of floor area, extend to the ceiling. This is too high for the handling of stock and too low to permit the construction of a gallery. Oils, waste, rags and many other highly inflammable merchandise are stored in open spaces and endanger the entire stock of merchandise.

The floor is at ground level and the low and inadequately sized unloading platform and lack of handling equipment produce hazardous conditions in handling merchandise.

The inadequacy of space is clearly indicated by the use of aisle space, hallways, and loading platform for storage.

Hazards also exist in the storage of compressed gas cylinders in the general warehouse.

The planning of adequate space should provide separate volatile and explosive storage sections designed to protect and isolate the various types of hazardous merchandise.

Space Analysis

	Present	Required
Warehouse and Storage	12,600 Sq. Ft.	19,000 Sq. Ft.
Volatile and safety storage	None	3,000
	12,600 Sq. Ft.	22,000 Sq. Ft.

17. Public Function and Other Storage--Furniture, public function equipment, and other miscellaneous storage is scattered over the entire campus. The facilities on the north campus consist of a section of a steel skeleton structure with sheet iron siding and roof.

An exact analysis of the space used is now being prepared but it is believed that the reconstruction of the Old Power Plant which would provide approximately 30,000 sq. ft. of warehouse space, would provide for this division and for overflow of dead and salvage storage.

18. Tool Room--This room is 1200 feet from the office. Because of the widely scattered shop areas, many tools are now stored in each shop which not only results in a duplication and low use factor for many tool items but also the duplication of facilities and records to maintain proper tool control.

A small room adjacent to the machine shop in the North Garage is now used for the storage of small general tools and equipment. A portion of the Warehouse Annex north of the North Garage is used for the storage

of ladders, ladder jacks, scaffolding, tackle and heavy equipment. Neither of these facilities were designed specifically for the storage of tools or equipment nor can they be properly adapted for such use because of their location, size and shape. The necessary hand handling of the heavier items of tools and equipment not only results in damage to tools but also results in having them improperly maintained and stored.

Space Analysis

	Present	Required
Tool Room, ladders, scaffolding, and heavy equipment	2,600 sq. ft.	6,000 sq. ft.

IV. ALTERNATIVES

A. Remodeling Existing Facilities.--This alternative is considered impractical because:

1. Continued use of rail facilities cannot be assured.

2. The much needed centralization of facilities will not be accomplished. The present decentralization is conducive to a duplication of equipment, personnel and records; prevents unified organization of control, the easy and prompt transmission of orders and subsequent check on the execution of allocated assignments. It is a major factor affecting the cost of maintenance and job order work because of:

a. Delays and misunderstandings in the transmissions of orders.

b. Time lost in travel between the various units.

c. Time required for transmission and assembly of necessary supplies from scattered storeroom areas.

d. Duplication of additional personnel for supervision

and follow-up of work in process. It is also conducive to loafing, deferment of work, unauthorized side trips of employees for personal matters.

3. The necessary additional space outlined in "III" above cannot be provided. The area now available is 60,700 square feet and the net floor area required is approximately 102,440 square feet, plus allowance for corridors, etc. (See Schedule No. 3).

4. It is impractical to fireproof the existing frame structures to provide safe work and storage facilities. Many of the structures are obsolete, requiring relatively high maintenance expenditures and should be removed.

5. Necessary yard space for exterior storage is not available.

6. Inadequate parking facilities result in the congestion of all streets and drives and thereby increases the fire risk materially. Future concentration of Physcial Plant activities in this area will merely increase this hazard and traffic congestion.

B. Expansion Into Mechanical Engineering Laboratory.—This alternative is considered impractical because:

1. Continued use of rail facilities cannot be assured.

2. Much needed centralization of facilities will not be accomplished.

3. Even with this additional space remodeled for Physical Plant use, the total area available would still be approximately thirty percent less than that necessary to provide adequate work and shop facilities.

4. This building cannot be remodeled to provide suitable facilities because:

a. Of the six different floor levels.

b. Satisfactory arrangement will be impossible, due to the shape and size of the building. The result would merely be a continuation of the many existing unsatisfactory conditions.

c. Necessary exterior yard and storage areas will not be available.

5. Inadequate parking facilities result in the congestion of all streets and drives and thereby increases the fire risk materially. Future concentration of Physical Plant activities in this area will merely increase this hazard and traffic congestion.

6. The estimated cost of remodeling the present Service Building and the Mechanical Engineering Laboratory for expansion is $360,000. The inventory value of the Mechanical Engineering Laboratory as of June 30, 1943, was $91,570, and of the Old Power Plant $142,850.

C. Construction of New Building.--The only practical solution from a long-term point of view seems to be that of constructing a new building adjacent to the Illinois Central tracks in the area of the Abbott Power Plant, the estimated cost of which will be approximately $650,000. The following is a suggested program for use and disposal of existing facilities:

1. The present warehouse and annex may be used temporarily in connection with the North Garage to furnish space for motorized equipment.

2. The Old Power Plant may be remodeled with new floors, dock facilities and elevators to provide space for furniture, seasonal equipment, deak storage and other long-term storage now scattered throughout various attics and spaces in academic buildings. The estimated cost of this is $150,000.

SCHEDULE NO. 1

VOLUME OF BUSINESS

	1937-38	1938-39	1939-40	1940-41	1941-42	1942-43
1. Maximum number of employees	587	539	583	678	595	489
2. Number of requisitions issued	4,205	4,184	4,384	4,332	3,943	3,267
3. Number of Job Orders completed for departmental work and improvements	2,891	2,989	2,865	3,094	3,273	3,458
4. Number of Repair Orders for major maintenance projects	872	737	619	567	388	402
5. Total number of Work Orders issued	29,261	29,336	29,737	32,489	32,947	32,292
6. Total number of detailed estimates prepared		427	343	369	313	283
7. Total expenditures for operation and maintenance of plant						
a) Bldg. Mntce.	$167,905.53	$151,836.15	$194,652.28	$184,478.41	$197,309.94	$145,549.72
b) Grounds "	43,894.69	45,754.92	45,581.54	72,650.81	58,185.31	46,345.53
c) General "	64,276.86	62,966.84	72,048.03	67,458.66	83,493.96	89,336.94
d) Trucks & Cars	29,111.76	26,267.48	34,043.08	35,765.20	40,821.32	31,912.02
e) Steam Generation	113,413.35	106,047.98	110,961.39	114,720.48	129,393.94	134,895.38
f) Power "	28,067.28	42,275.60	38,762.48	23,564.10	9,755.80	22,32[illegible]

	1937-38	1938-39	1939-40	1940-41	1941-42	1942-43
7--Cont.						
g) Aux. Power Equipment	$ 5,439.09	$ 4,873.07	$ 4,548.01	$ 6,959.27	$ 8,855.05	$ 9,494.30
h) Supts. & Records	8,341.46	9,606.30	11,281.83	8,774.62	8,216.72	9,887.35
i) Gas	5,669.30	5,649.57	5,669.92	5,410.87	4,888.63	5,409.56
j) Water Station	18,094.08	15,897.28	17,855.21	18,062.00	14,157.00	9,929.17
k) Bldg. Operation	156,867.80	159,202.20	166,815.86	184,600.82	194,444.79	192,625.67
l) Fire Station	15,896.03	16,451.21	16,889.33	19,871.88	28,252.45	29,144.15
m) Police & Watchmen	23,026.84	28,267.34	34,028.10	38,819.15	35,488.17	53,412.89
n) Administration	91,712.02	92,806.24	109,027.52	128,550.83	72,456.52	63,302.30
8. Total cost of work completed on						
a) Job Orders	270,944.14	227,511.71	249,767.30	120,694.79	445,358.88	398,221.39
b) Invoice accts. and blanket orders	11,223.13	20,776.20	11,770.10	11,198.33	9,653.65	6,283.55
9. Total cost of work completed (Items 7 + 8)	$1,050,883.36	$1,016,192.09	$1,123,701.98	$1,041,580.24	$1,340,732.13	$1,248,073.68
10. Stores Operation						
a) Total purchases	$216,744.11	$191,680.77	$214,221.55	$193,070.40	$205,049.22	[illegible]
b) Total sales	217,581.38	194,550.72	213,686.61	187,408.68	181,745.50	[illegible]
c) Inventory value as of June 30	74,226.83	72,764.88	67,811.57	73,473.29	100,960.21	102,721.79

Physical Plant Department
jd:lg
February 19, 1944

SCHEDULE NO. 3

SPACE ANALYSIS SUMMARY

Area	Present (Sq.Ft.)	Total (Sq.Ft.)	Required (Sq Ft.)	Total (Sq.Ft.)
1. Carpenter Shop				
a) Finished lumber storage	8,600		9,000	
b) Office, machine tools & checking space	750		500	
c) Locker and personal tools	none		600	
d) Toilet and washroom	100		120	
e) Machine room	1,700		4,000	
f) Finished products, storing & receiving	none		600	
g) Sanding, assembling, gluing, etc.	2,250		2,500	
h) Painting, finishing, drying	600		1,400	
i) Personal tools	none		300	
j) Rough and dimension lumber	3,200	17,200	4,000	23,020
2. Electric Shop				
a) Shop	6,300		5,000	
b) Toilet and washroom	none		120	
c) Lockers and personal tools	none	6,300	300	5,420
3. Telephone Exchange	550	550	600	600
4. Plumbing Shop				
a) Shop	800		[illegible]	
b) Toilet and washroom	none		100	
c) Lockers and personal tools	none	800	200	1,500
5. Paint Shop				
a) Shop	400		600	
b) Glass storage & glazing	600		600	
c) Lockers, toilet & washroom	none	1,000	400	[illegible]
d) Separate storage - paints & oils	1,800		2,000	
e) Dispensing & supplies in process	none	1,800	1,000	4,000

	Present	Total	Required	Total
6. Key Shop				
a) Shop	450		450	
b) Vault	none	450	50	500
7. Furniture Repair Shop, Shades, Awnings, and Blinds	800	800	1,200	1,200
8. Sheet Metal and Roofing Shop				
a) Shop	900		3,000	
b) Lockers, toilet, and washroom	none	900	200	3,200
9. Construction Laborers, Cement Finishers, Brickmasons	none	none	800	800
10. Machine Shop	3,000	3,000	5,000	5,000
11. Grounds Shop				
a) Office and small tools	600		600	
b) Lockers and personal tools	none		800	one-half heated
c) Storage	5,400	6,000	10,000	11,400
12. Steam Distribution Shop				
a) Shop and storage	3,400		3,600	
b) Lockers and toilets	none	3,400	400	4,000
13. Administrative Offices	3,300	3,300	12,000	12,000
14. Warehouse and Stores				
a) Storage	12,600		19,000	
b) Safety storage	none	12,600	3,000	22,000
15. Tool Room	2,600	2,600	6,000	6,000
		60,700		112,440

Note: The total required area shown is the net area. An allowance of approximately 10 per cent should be made for corridors and partitions. It is estimated that a total of approximately 113,000 square feet of floor area will be required.

3. The basements of Engineering Hall, Transportation Building and Health Service should be abandoned as these are unsuitable except for pipe space or storage for the occupants of the buildings.

4. All frame structures should be abandoned and removed because they are hazardous, unsightly and unsuitable for modern use.

5. The South Garage and Old Agronomy car storage barn should be abandoned as soon as adequate garage facilities are available. As these are contiguous to the Agriculture Engineering Building, these spaces probably could be used by them for equipment storage.

6. The space vacated in the Wood Shop will provide room for expansion for the Industrial Education shops and foundry or for other academic use.

Prepared by the Physical Plant Department.

PROJECT P. P. 2a

ADDITIONAL TURBO-GENERATOR FOR POWER PLANT

It is proposed that the firm of Sargent & Lundy be retained to provide engineering service covering the installation of a 3000 kw. turbo-generator in Abbott Power Plant.

Estimate $125,000.00

In Sargent & Lundy's original report, submitted in October, 1938, and covering the new power plant project, they recommended the installation of three 3000 kw. turbo-generators for the new installation. This recommendation was based on a current electrical peak demand of 2600 kw., an expected peak demand of 3800 kw. in 1941-42, and a peak demand of 3900 kw. in 1943-44; not including the demands of a proposed program for increasing lighting intensities in practically all existing buildings. The installation of generating capacity to meet standards of firm power capacity requires: "Sufficient capacity such that the maximum peak demand can be carried with the largest generating unit out of service." The maximum 15-minute peak demand in 1941-42 was 3750 kw. This required the operation of both of the two 3000 kw. generators, leaving no reserve generating capacity excepting the 1000 kw. generator at the Physical Plant Service Building. The operation of the 1000 kw. generator is impractical due to: (a) lack of steam main capacity limits generator capacity to 450-500 kw.; (b) the unit is remote from the central plant; (c) curtails demands for high pressure steam at M. E. Lab., Locomotive Lab., Dairy Manufactures Plant, Hospital, Residence Halls, Woman's Building, and miscellaneous demands on the campus.

The maximum demand during 1942-43 and 1943-44 has reduced to 3600 kw. due to the reduced enrollment and day-light saving time. Term-

ination of the war with a return of student enrollment to 11,000 will cause an expected demand of possibly 4000 kw. The plant is now operating in violation of the firm power capacity standard and therefore another generator is necessary to place the plant on a safe operating basis, during peak demand periods of October 1 to May 15.

The maximum demand for the summer period has not exceeded firm power standards. However, operation is even more hazardous in that electrical demands must be supplied by the condensing-extraction type generating unit. If this unit is not available for summer time use, the plant could not supply demands in excess of 1500 kw. for over an eight hour period. Normal demands for week day periods of 8:30 tp 11:45 a.m. and 1:15 to 5:00 p.m. approximate 2500 kw. The electrical capacity of the non-condensing unit, having no condensing capacity in the plant with the extraction-condensing unit out of service, is limited by the demand for exhaust steam that can be wasted to the atmosphere. Maximum exhaust steam demands for the summer period are of the order of 20,000 lbs. per hour. The amount of steam that can be wasted to the atmosphere is limited to the capacity of the boiler feed water treating equipment, which is 12,000 lbs. per hour. The total capacity for treating boiler feed water is 92,000 lbs. between regenerating periods, and regenerating the treating plant requires 1.5 hours. The non-condensing unit has a 22 lb. per kwh. steam rate at 12 lb. gage exhaust pressure or 22 lbs. divided into 32,000 lbs. limits the capacity of this unit to 1500 kw. for an 8 hour period.

Another hazard experienced during the present operation, in violation to firm power standards, is the lack of sufficient time to inspect, and overhaul turbo-generator units. Each of the two turbo-generators should be taken out of service for a minimum period of ten days, once

each year for a thorough inspection, under the direction of a factory engineer, and in the presence of an insurance inspector. During these scheduled outage periods, the University is dependent upon the operation of one generator for its supply of electrical energy. Generator outages have been scheduled for vacation periods at Christmas and August 15 to September 15. The past Christmas holiday period was only seven days duration; there were only ten days between semesters for regular students. Electric loads during the between-semester period just past were as high as 3000 kw.

Past operating experiences emphasize the need for another generator to (1) meet firm power standards, (2) insure safe and reliable service, (3) provide reserve capacity for emergency or maintenance outages, and (4) provide adequate capacity for the present and proposed increases in connected loads and peak demands for electrical power services.

Since the erection of Abbott Power Plant, there have been major increases in the connected electrical load not contemplated during the design period of the plant. The following is a tabulation of the increase in connected electrical load in kilowatts for the period from 1940 to 1944:

Building	Kw.
Abbott Power Plant	150
Administration Building	15
Agronomy Field Laboratory	7
Altgeld Hall	8
Animal Husbandry Sheep Barns	5
Ceramics Kiln House	26
Commerce Building	3
Dairy Experimental Farm House	7
Dairy Manufactures Building	5
Electrical Engineering Laboratory	12
Filtration Plant	1
Fire Station	7
Garage and Shops	10
Geological Survey Laboratory	120
Gymnasium Annex) Gymnasium, Men's Old)	50

(continued on following page)

Building	Kw.
Gymnasium, George Huff	10
Gymnasium, Women's	5
Harker Hall	5
Health Service	10
Horticulture Field Laboratory	10
Illini Union	20
Library	20
Lincoln Hall	35
Machine Tool Laboratory	20
McKinley Hospital	5
Mechanical Engineering Laboratory	10
Military Stables	35
Mining and Metallurgy	150
Natural History Building	20
Natural History Survey Greenhouse	6
Natural Resources Building	50
Natural Resources Garage	19
Noyes Laboratory	20
Nuclear Radiations Laboratory	200
Paint, Key and Shade Shop (104 S. Goodwin St.)	5
Men's Residence Hall	15
Women's Residence Halls:	
Davenport House	5
Laura B. Evans Hall	2
Mary E. Busey Hall	3
Sanitary Engineering Laboratory	25
Skating Rink	75
Stadium (W)	60
Talbot Laboratory	10
Vegetable & Plant Breeding Greenhouse	6
Vivarium	5
Woman's Building	10
Total	1297 Kw.
Estimated relocated equipment - deduct	97 Kw.
Net Additional Load	1200 Kw.

As previously stated, the present peak electrical demand is 3600 kw. as compared to 3700 kw. in 1941-42. However, the total consumption of power has increased steadily regardless of the reduced enrollment and daylight saving. This increase in the use of power is no doubt due to (1) increased connected load, and (2) increase due to normal growth. The decrease in peak

demand can be assigned to (1) decrease in student enrollment and University research programs, (2) daylight saving, (3) favorable weather conditions in that the dark days have not occurred on peak load days, normally Wednesday or Thursday, and (4) in general, University personnel have cooperated in conserving utilities.

The relation of hourly maximum demands to the firm capacity clearly indicates the necessity of a third generating unit since 1938-39, or the year the new plant was designed and erection started. Based on the assumption that the war will be over by July 1, 1945, and the proposed post-war program will begin, the engineering, specifications, and contracts for a new generating unit should be complete, with contracts let by January 1, 1945.

If W. L. Abbott Power Plant is to provide firm, safe, and reliable electrical power service, funds should be provided immediately to engineer the installation of a third generating unit.

The foregoing discussion has not considered the possibilities of near-future or post-war demands of the new Airport, Betatron Laboratory, or any new buildings requiring in excess of 100 kw. per year that may be added after 1944-45.

Prepared by: The Physical Plant Department

PROJECT P.P. 2b

ADDITIONAL STEAM GENERATOR FOR POWER PLANT

It is proposed that the firm of Sargent & Lundy be retained to provide engineering service covering the installation of one 100,000 lb.-per-hour boiler unit, complete with building addition, at W. L. Abbott Power Plant.

Estimate . . . . . $ 325,000

The plant as originally installed in 1939-40 consisted of three 80,000 lb.-per-hour steam generators, with forced and induced draft chain-grate stokers for burning low grade Illinois coal.

During the three and one-half years of operation of the plant, capacity tests have demonstrated that boiler design capacities can be obtained. However, the ability to maintain design capacities for the duration of peak demands is dependent on limiting factors which cannot be maintained. Principal factors governing the ability of individual units to meet design capacities are:

1. Cleanliness of boiler heating surfaces at time of peak demand.
2. Uniformity of coal size at time of peak demand.
3. Depth or thickness of fuel bed at time of peak.
4. Availability of individual boilers.

The duration of peak demand loads are entirely dependent on weather conditions, and to date minimum outside temperatures comparable to those experienced in January 1936, or January 1940, have not occurred. Except for slight variations not exceeding 10 per cent, steam demands will be dependent on the duration of the minimum temperatures. On January 23, 1936, the outside temperature was a minimum of -23° F. with a 24-hour average of -15° F. Again on January 18, 1940, the minimum outside temperature was -15° F., with a 24-hour average of -11° F. The new plant has not been called upon to meet the

steam demands of the above conditions. However, the present steam demands have reached a maximum of 160,000 lbs. per hour, which is the firm capacity of the plant. It is estimated that under the present load conditions, with an average outside temperature of -15° F., the maximum hourly steam demand would amount to 170,200 lbs. per hour. A steam demand of this amount would necessitate the operation of all three boilers for the duration of the minimum temperature period.

Present boilers were designed with auxiliary cleaning equipment, for a high availability factor or long periods of continuous service. Experience has demonstrated that individual units can be depended upon for service periods in excess of six months. However, the efficiency of soot blowers and hand lancing is far from perfect. There is a gradual building-up of slag, soot, and some internal scale which gradually lowers the boiler's efficiency and capacity. Settings develop air leaks, and metal growth affects stoker operation, which cannot be adjusted except during outage periods. Experience has also taught that individual boilers should be taken out of service at least once every four months for routine cleaning of the outside of all heating surfaces, adjustment of stokers to compensate for metal growth, replacement of broken links, and internal cleaning of boiler tubes and headers in critical hot zones. At present, boiler outages cannot be scheduled on account of unpredictable weather conditions and the dependence placed upon all units for necessary continued service during the months of December to March, inclusive.

In estimating the possible maximum steam demand of 170,200 lbs. per hour, no allowance was included for the possible effect of the electric load. Should a peak electric demand occur simultaneously with a -15° F. outside

temperature, the maximum steam demand would be increased by at least 7,000 lbs. per hour or the minimum amount necessary to operate the extraction-condensing unit, for electric loads of 500 kw. and above.

It also is fortunate that past peak demands have occurred during sub-normal load periods. The coldest day of 1941-42 heating season occurred on Saturday, a normally low period considering building use. The coldest day of the present season, -10° F., occurred on Saturday, February 12, which happened not only on Saturday but during a between-semester period. The season of 1942-43 was abnormally mild, with a recorded minimum temperature of -2° F.

Improvements in steam distribution and utilization; improvements in boiler efficiency; improvements in building heat controls; scheduled operation of ventilating equipment, have all contributed to reductions in total steam consumption, but maximum steam demands will show a steady increase dependent on connected heating load, outside temperatures, and electric power consumption.

The firm capacity curve clearly shows the present and future need for an additional steam generating unit which should be added simultaneously with the third turbo-generating unit proposed in Project P.P. 2a.

Prepared by: Physical Plant Department

PROJECT P.P. 2c

EXTENSION OF STEAM DISTRIBUTION TUNNEL

It is proposed that funds be appropriated to construct a steam distribution tunnel extending from the present tunnel at Sixth Street and Gregory Drive south along Sixth Street and east to connect with the existing tunnel in front of the Natural Resources Building, and to provide lateral connections to serve (1) Civil Engineering Surveying Building, (2) Architecture Building, and (3) Commerce Building.

Estimate $90,000

This improvement was included in the recommendations of Sargent & Lundy's report on the new power plant project in October 1938. Lack of funds prohibited the installation at the time the new power plant was constructed.

Exhaust heating main capacity is adequate from Abbott Power Plant to Sixth Street and Gregory Drive. At that point the two 12-inch exhaust mains connect to one 12-inch main which extends north then east to connect to a 10-inch main at the north side of the Library. The one 10-inch main extends north in a tunnel under Wright Street and east along the north side of Gregory Hall. Branching from the Gregory Hall junction, one 10-inch main extends east through the Auditorium and another extends north through Lincoln Hall.

The exhaust steam pressure required at Sixth Street and Gregory Drive is 40 lbs. per sq. inch when the outside temperature is 0° F. This pressure is the result of excess pressure drop in the overloaded 12- and 10-inch mains described above.

At present there is a lack of exhaust steam main capacity, in particular the area directly west and north of the Library. Also, exhaust steam, to reach the Natural Resources Building, must take the indirect route through

the Auditorium and back south along the east side of the campus, a distance of approximately 4,800 pipe line feet, as compared to the 1,200 feet required if a tunnel is provided from Sixth Street and Gregory Drive to the building.

The recommended improvements will:

1. Provide the closing link in a loop system permitting dual exhaust main service, for all main exhaust steam lines;
2. Reduce the required exhaust steam heating main pressures;
3. Improve turbo-generator efficiencies through a reduction in exhaust steam pressures;
4. Reduce transmission losses through a reduction of exhaust steam temperatures and pressures. Present exhaust steam is superheated, dependent on its pressure, from 30 to 90° F.;
5. Provide for the replacement of the present hazardous, inefficient, 10- and 8-inch underground steam conduit mains from the Armory and now serving the Library, Civil Engineering Surveying Laboratory, Commerce, Architecture, Animal Pathology, and Mumford House;
6. Permit the removal of main exhaust steam lines from the Library basement which is a constant hazard in that a rupture could damage thousands of dollars worth of books; and
7. Provide tunnel steam service for expected new buildings in the South Campus area.

It is recommended that funds be appropriated as early as possible to complete the necessary engineering details, so that construction can start at the end of the present national emergency.

Prepared by: The Physical Plant Department

PROJECT P.P. 2d

ADDITIONAL WELLS AND WATER STORAGE CAPACITY

I. INTRODUCTION

It is proposed that a new well having a capacity of 600 gallons per minute and a clear water storage basin with a capacity of 250,000 gallons be constructed at once, in order to provide an adequate water supply for normal University use and for the water required to fight a five-hour fire in the congested portion of the north campus. In addition, another well should be constructed about 1950 to supplement the yields of Wells 10 and 11, which at that time will be 15 years old. It is not prudent to estimate the useful life of wells terminating in sand and gravel beyond a period of 15 years.

The costs for the improvements recommended above are as follows:

One well to be constructed at once	$ 25,000
250,000-gallon clear water storage basin	25,000
Second well to be constructed in 1950	25,000
Total	$ 75,000

Water for the University of Illinois is obtained from a group of six wells. These wells all terminate in sand and gravel deposited when the glaciers retreated. Most of these wells are approximately 160 feet deep. The date of construction, the depth, the location, the size of screen, and the quantity of water which may be obtained from the wells is shown in the table on the following page.

Wells 3 and 4 are not reliable and can be operated for only a few hours at a time. Most of the water is obtained from Wells 10 and 11. Both wells 10 and 11 originally yielded about 600 gallons per minute each when they were new.

Statistics Concerning Present Wells

Well No.	Date of construction	Depth ft.	Location	Size of screen in.	Quantity of water g.p.m.
3	1904	142	West end Electrical Engineering Laboratory	8 (?)	50
4	1906	143	North side Electrical Engineering Laboratory	12	50
7	1924	172	Sixth Street, 1/2 block north of Healy Street	16	240
9	1931	250	Adjacent to Well 3 behind the E. E. Lab.	22	117
10	1935	160	Romine Street near Stoughton Street	26	350
11	1935	160	Romine Street near Main Street	26	518

A total of 750,000 gallons clear water storage is available for the water supply; 250,000 gallons of this is located at the Filtration Plant and consists of a covered, concrete reservoir. This reservoir receives water from the filters and supplies water to the high lift pumps which pump water to the distribution system and to a 500,000-gallon elevated tank, built on high land near the Horse Barns on St. Mary's Road. The overflow of this tank is placed at an elevation of 865 feet above U.S.G.S. datum, which is approximately 140 feet above the ground level at the north campus. This elevation furnishes a pressure of about 60 pounds per square inch on the water mains on the main campus.

II. PRESENT DEMAND

The average daily demand for water during the fiscal year 1942-43 was 694,000 gallons. The consumption has decreased during the last few years.

This is due in part to three causes: (1) the installation of water-conserving equipment, (2) reduced student enrollment and University research program, and (3) the purchase of water from the local water company for the Abbott Power Plant. The table below shows the quantity of water used during the last three fiscal years and the first six months of 1943-44:

Statistics on Water Used

Year	Total Water in gallons	Daily Consumption in Gals. Average	Maximum
1940-41	280,247,000	768,000	1,430,000
1941-42	261,967,000	718,000	1,096,000
1942-43	274,574,000	694,000	1,112,000
1943-44*		792,000	1,281,000

* First six months of 1943-44

The day of maximum demand shown in 1940-41 is not considered representative because, during that year, water was still being used from the University system by the old power plant on Mathews Avenue. Consequently, the quantity of water used during this day is considered to be 1,281,000 gallons, which occurred on July 28, 1943.

The amount of water required for fire-fighting purposes among the congested buildings on the north campus was estimated by the National Board of Fire Underwriters to be 4,000 gallons per minute. On the basis of a five-hour fire, then 1,200,000 gallons of water would be required for fire-fighting purposes. The domestic demand, the water used for normal purposes such as laboratories and office buildings, would be 267,000 gallons during the same period of time, or the total amount of water which must be delivered from all sources must be 1,467,000 gallons. Under the present conditions when peak

demands occur, the University wells should supply 402,000 gallons, and two-thirds of the total quantity of the clear water storage should be available or, in other words, should provide 500,000 gallons. An additional 180,000 gallons can be obtained from the local water company by means of the connection between the University mains and the local water company mains just south of the Auditorium. This would leave a deficiency of 385,000 gallons.

III. POSSIBILITIES OF INCREASED SUPPLY

Water may be obtained to meet the domestic demand and the demand for fire-fighting purposes through either one of three sources: additional wells finished in sand and gravel, additional storage, or through a combination of additional wells and additional storage. Well drilled through the glacial drift into limestone or sandstone below would probably yield salt water. The water obtained from these formations at other places has been found to be highly mineralized.

Additional Wells.--The first solution, i.e., additional wells, offers certain advantages and disadvantages. The advantages of providing additional wells are:

1. When one unit is out of service, the reduction in the water supply at source is less.
2. Water is cooler.
3. Provides a reserve for future use.

The disadvantages are listed as:

1. Rapid depreciation caused by the clogging well screens by crenothrix, calcium carbonate or sand.
2. Limited, known area of well field where suitable formation may be found.
3. Idle wells increase the unit cost of water used.

4. Water level in well field would be lowered more if several wells are operated simultaneously at the time of pumping. Under such conditions the pumps might draw air.

Additional Storage.--The second possibility for increasing the quantity of water available during heavy demands is to increase the facilities for storing filtered water. An increase in the facilities for storing filtered water would provide water during times of peak consumption but has certain advantages and disadvantages. The advantages are:

1. Greater dependability since withdrawal of water from storage does not depend on condition of well screens, well pumps, low lift pumps and filters.
2. Reduces peak load on wells, low lift pumps and filters.
3. Less depreciation since the life of a concrete basin should be 40 to 50 years.
4. Provides additional reserves when any existing reservoirs or tank is out of service.

The disadvantages are:

1. Basin must be supplied with water from some source.
2. Stored water might require slight additional chlorine treatment.
3. Temperature of water stored may rise during the summer making it less attractive for drinking water.

Combination of Well and Reservoir.--The third possibility for supplying the existing deficiency consists of a combination of wells and storage. This plan combines the greater dependability which may be obtained from storage basins together with a sufficient well supply to maintain the storage in these basins at an average cost for depreciation.

The advantages of this procedure are listed on the following page:

1. The combination provides for an adequate supply of water at the source if water is available in the formation.
2. The cost for depreciation is not excessive.
3. The additional storage provides greater dependability than that provided by more wells.
4. Less reduction in water level would occur in the formation during peak periods than if more wells were to be used with the present storage, only.
5. Provides additional reserve when any existing well, reservoir, or basin is out of service.

The disadvantages are:

1. The combination does not supply as large a well capacity for future use.
2. The cost for depreciation is greater than for increased storage alone.

IV. CONCLUSION

A careful review of the requirements and the advantages and disadvantages of various plans indicates that a well of a capacity of 600 gallons per minute and a storage basin holding 250,000 gallons should be provided at once, in order to take care of the present demands for water for normal consumption and to provide a reserve for fire-fighting purposes. It also clearly indicates that an additional well should be provided about 1950 in order to make up for the loss in production of Wells 10 and 11, which may be expected by that time.

In view of the difficulties which are expected in maintaining a water supply from wells finished in sand and gravel in this area and in view of the limited, known sites of satisfactory wells, and the rapid lowering of water level in the water bearing formation, it is urgent that some other source be secured for water in the future. A separate proposal is being submitted for studies and exploration for the development of a future water supply.

Prepared by: The Physical Plant Department

PROJECT P.P. 3

MODERNIZATION OF EXISTING BUILDINGS

This project consists of a very large number of smaller projects which it is proposed to carry on in nearly every building on the campuses in Urbana and Chicago. The types of items which are included in this general project are listed in the Summary at the beginning of this section. The Physical Plant Department has in its files plans and estimates concerning many of these items.

A large portion of this project will consist of modernizing and remodeling, for classroom and office use, space which would be vacated if new laboratory buildings are constructed.

It is not feasible to give detailed consideration to this project in this report.

Prepared by: W. C. Huntington
Chairman, Building Program Committee